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DISEASES CAUSED BY BACTERIA AND FUNGI.

KLIMMER, M., & WEISKE, Gertrud. (1936). Zur Züchtung der Galtstreptokokken aus Milch. I. Wärmerversuche. [**Culture of Mastitis Streptococci from Milk. I. Heating Tests**].—*Milchw. Forsch.* **18.** 215-220. 1 table. [7 refs.]

The authors found that the cultural recognition of mastitis streptococci in milk samples containing other bacteria is not made easier by a previous heating of the samples at 55°-65°C. for 5 to 30 minutes. The contrary is often the case.

In a second experiment it was found that there was no advantage in incubation at 40°-42°C. because, whilst the colonies of mastitis streptococci were much reduced, the number of colonies of other bacteria was not affected. The medium used throughout was the serum alkali-albuminate-saccharose-brom-cresol-purple agar previously described.—A. W. STABLEFORTH.

I. BRYAN, C. S., & TROUT, G. M. (1935). **The Influence of Streptococcic Infection of the Udder on the Flavor, Chloride Content, and Bacteriological Quality of the Milk Produced.**—*J. Dairy Sci.* **18.** 777-792. 10 tables. [6 refs.]

II. DEVEREUX, E. D., & BRYAN, C. S. (1936). **The Effect of Streptococcic Mastitis on the Methylene Blue Reduction Test.**—*Quart. Bull. Mich. agric. Exp. Sta.* **18.** 161-163. 1 table. [2 refs.]

III. BRYAN, C. S., & DEVEREUX, E. D. (1937). **A Comparison of the Microscopic Test, Hotis Test and Blood Agar Plate in Detecting Streptococci of Mastitis in Milk.**—*Cornell Vet.* **27.** 68-74. 2 tables. [3 refs.]

I. The authors tested 258 samples from 60 cows in two infected and one clean herd over a period of 6 weeks to determine the effect of streptococcus infection on the flavour (salty or not), chloride content, cell content and methylene blue reduction time. It is not possible to give details here, but it may be said that as regards all the above characters, the milk from the infected cows was of the lowest quality, that from the non-infected quarters of infected cows standing next, whilst the best milk was obtained from streptococcus-free cows. The elimination of streptococcus-infected cows in two herds was followed by an improvement in the

quality of the milk as regards the above test. None of these tests can, however, be used alone to diagnose mastitis.

II. 26 samples of mastitis milk showed a methylene blue reduction time of from three minutes to five and half hours. In many cases the addition of mastitis positive milk to mastitis negative milk decreased the reduction time significantly ; in some cases when only 10% of mastitis milk was added. The decreased reduction time was correlated with an excess of leucocytes.

III. The comparison was made (1) on 350 composite samples from the four quarters of each cow, and (2) on composite and quarter samples from 80 cows. All samples which showed streptococci at a microscopic examination made after incubation at 37°C. for " at least 12 hours " were considered as positive. 89% of these positive samples were detected by culture in blood agar [volume of milk and whether whole milk or sediment etc. not stated]. In the case of composite samples 50-60% were detected by means of the " Hotis " test when read at 24 hours and 60-70% when it was read at 48 hours. In the case of quarter samples the percentages at 24 hours and 48 hours were 64% and 78% respectively. Many doubtful results were, however, obtained at the 24 hours reading and more at the 48 hours reading.

Six cows were examined 12 times within 30 days. Three gave constantly positive results, and three constantly negative results by the microscopic or cultural test. Variable results were obtained by the " Hotis " test. This test is, therefore, regarded as of little value. [No evidence is given that all the streptococci seen microscopically were mastitis streptococci].—A. W. STABLEFORTH.

UMEZU, M., & HAYASHI, R. (1937). **On the Relation between the Quantitative Changes of Each Serum Protein and the Increase in Efficacy of Immune Serum throughout the Course of Anthrax Hyper-Immunization of Horses.** —*J. Jap. Soc. vet. Sci.* **16.** 107-135 of pt. 1. 3 plates, 27 tables. [7 refs.] [In Japanese : abst. from English summary pp. 17-18 of pt. 2].

The relation between the amounts of the serum proteins and the efficacy of immune serum was followed throughout the course of anthrax hyperimmunization in horses. The albumin decreased (–18%), and the total globulin increased (+58%), especially pseudoglobulin I (+119%) and pseudoglobulin II (+27%). The albumin-globulin ratio decreased in immunized horses from a normal of about 0·9 to 0·5. A serum with such a ratio (0·5) has been found to be an effective anti-anthrax serum. Hyperimmune serum shows its greatest efficacy on the 9th-11th day after inoculation with *B. anthracis*, and then tends to drop.—D. L. HUGHES.

MCCARTER, Janet, HASTINGS, E. C., & BEACH, B. A. (1937). **The Presence of Avian Tubercle Bacilli in the Lymph-Nodes of Cattle.**—*J. Amer. vet. med. Ass.* **90.** 619-626. 2 tables. [8 refs.]

In Wisconsin, which has been an accredited state for bovine tuberculosis since 1932, 0·24% of cattle tested in 1935 reacted to tuberculin. Sensitization by the avian tubercle bacillus was responsible for a part of this residuum of reacting cattle. Of the tuberculous lymph nodes of 28 reacting cattle examined by cultural methods and by g. pig inoculation, 3 were found to be infected with avian bacilli and 23 with mammalian bacilli, whilst negative results were obtained on the remaining 2.

The superiority of Herrold's uncooked egg-yolk medium [*V. B.* **1.** 263.] over Dorset's egg medium for cultural isolation of bacilli from infected tissues is shown, but it was not quite so satisfactory for this purpose as was g. pig inoculation. —N. J. SCORGIE.

INNES, J. R. M. (1937). **The Pathogenesis of Tuberculosis in Animals according to the Nieberle School.**—*Vet. Rec.* **49.** 783-797. 4 figs. [Numerous refs.]

This is a very useful account of the pathogenesis and comparative pathology of tuberculosis. I. first deals with the mechanism of infection in the human subject, where he points out that in such a condition as adult phthisis there are now three generally recognized stages – "primary complex", post-primary dissemination, and reinfection with the production of isolated pulmonary TB. The various stages in the progress of the disease are clearly described. A primary infection with the tubercle bacillus occurs very early in life in almost every living person of civilized communities, and if careful search is made the primary focus can easily be recognized, even if there are post-primary lesions.

Our knowledge of the pathogenesis of tuberculosis in animals is due largely to NIEBERLE and his colleagues who have carried out extensive studies on the comparative pathology of the disease. In the light of their work, I. next deals with tuberculosis in dogs, cats and bovines, and points out where the pathogenesis is analogous with, or differs from that in man. He has not been able to find any trace of healed " primary complex " infection in the dog; when " primary complex " does occur early spread and generalization are almost the rule, *i.e.* the disease is probably progressive and fatal from the onset. There is thus no analogy with adult phthisis in man. The lesions and method of spread in the body are described. In cattle the pathogenesis is somewhat analogous to the three stages in man. In the adult bovine, however, chronic disease of the late generalization period affects not only the lungs but also the udder and perhaps uterus, kidneys and bones. Three distinct anatomical forms of TB. of the udder are described, and it is emphasized that infection of the udder is due to haematogenous spread. Congenital tuberculosis of calves arises as a result of a placental TB. of the dams.—N. J. SCORGIE.

HJÄRRE, A. (1937). Om variationer i den patologisk-anatomiska bilden vid tuberkulos. [**Variations in the Pathological Appearance of Tuberculosis**]. —*Svensk VetTidskr.* **42.** 35-53.

A general survey of the pathological-anatomical picture of TB. in domestic animals. H. first points out the great variety of changes. Infection with *Mycobact. tuberculosis* does not always produce tubercles; the process may be exudative, *e.g.* in cases of canine exudative pleuritis the only factor that differs from that of a simple inflammation is the existence of bacilli in the exudate. Calcification does not always appear, (1) in cases of equine or canine TB., (2) in the most common type of udder TB. in cattle (the lobular infiltrating type), or (3) in TB. processes caused by the avian type in cattle and swine. The regional lymph nodes of a tuberculous organ are often affected, but this is not an absolute rule. With the lobular infiltrating form of udder TB. in cattle the corresponding lymph nodes are generally not affected. On the other hand they are sometimes affected in the absence of lesions in the udder.

H. gives a summary of RANKE'S, HUEBSCHMANN'S and NIEBERLE'S doctrines. In calves the primary complex usually appears in the alimentary canal, and in older calves generally in the respiratory tract. In the horse and pig the alimentary canal is the most common port of entry of infection. In dogs and cats both aerogenous and alimentary infections occur. Finally H. points out that the avian type can infect man as well as cattle. In swine both the bovine and the avian types cause pathological changes. The horse can be infected with all the types of tubercle bacilli. The dog and the cat are susceptible to the bovine and the human types. Out of 37 tuberculous dogs autopsied at the Pathological Institute, Stockholm

Veterinary College, 21 showed infection with the human type and 16 with the bovine type.—H. BERTHELSEN (STOCKHOLM).

GERLACH, H. (1937). Wie kann die Tuberkulose wirksam bekämpft werden? [**Control of Tuberculosis**].—*Dtsch. tierärztl. Wschr.* **45.** 3-7. [6 refs.]

The Ostertag voluntary scheme for controlling bovine TB. in Germany has not resulted in bringing its incidence down to a low figure. G. found that most tuberculous cattle were on farms which breed for the highest production of milk and meat, or in the possession of poor men where the cattle have insufficient light, air and food. Therefore, the measures he proposes aim at breeding cattle which are not only productive, but above all resistant, and at forcing the farmer to active contribution in control work. This he hopes to attain by making the farmer bear the loss which TB. causes to his cattle, but suggests that when control has been effected by good breeding and management the farmer should be compensated.
—G. HARTMANN (VIENNA).

FELDMAN, W. H., BOLLMAN, J. L., & MANN, F. C. (1936). **Susceptibility of Chickens to Tuberculosis following Spontaneous Exposure to the Infection.** —*J. Amer. vet. med. Ass.* **89.** 551-561. 3 tables. [10 refs.]

In order to demonstrate the susceptibility of adult fowls to TB. on exposure to natural infection by cohabitation with infected fowls, 29 healthy fowls which had given a negative tuberculin reaction and were taken from flocks in which TB. was not known to occur were mixed with 30 fowls which had previously reacted to tuberculin. The experiment continued for 600 days and during that period the birds were kept in close contact under unhygienic conditions. Only 7 (24%) of the healthy fowls became affected with TB. and showed lesions of the disease on P.M. examination, while 19 of the 30 fowls that reacted positively to the tuberculin test before the start of the experiment were found to be affected with TB.

The 29 fowls which were exposed to infection were repeatedly tested with tuberculin but only one bird gave a positive reaction and it had extensive lesions at necropsy.

The results indicated that when in close contact and under unhygienic conditions the majority of chickens resisted exposure to TB. for a considerable period.
—R. F. GORDON.

HIROKI, H. (1935). **Research on Bovine Tuberculosis. I. Bovine Tuberculosis in Manchukuo.**—*J. orient. Med.* **23.** 745-757 of pt. 2. 1 plate, 14 tables. [14 refs.] [In Japanese: abst. from German summary p. 52 of pt. 1].

Of 40,000 cattle slaughtered at Mukden abattoir between 1930 and 1934 an average of 4% were affected with bovine tuberculosis. Tuberculin tests suggest that the incidence of bovine TB. in the country is very high. Kirchner's synthetic medium is recommended for the cultivation of bovine tubercle bacilli. Amongst 34 strains only one was of the eugonic type.—E. E. JELBART.

SCHMIDT, J. (1937). Tuberkulose beim Wild. [**Tuberculosis in Game**].—*Berl. tierärztl. Wschr.* Jan. 8th. 17-20. [18 refs.]

S. published the results of meat inspection with regard to TB. in game shot in the hunting grounds of the Duke of Anhalt, which had been carried out in the years 1898-1918 by HONIGMANN. The number of animals was 43,531. Stomachs and intestines could not be examined because the animals had been eviscerated. Of 6,713 roes, one was found to be tuberculous and in 7,735 stags, 36 tuberculous

organs were found, 30 whole bodies being confiscated. One stag found *in extremis* was also tuberculous. In 18,042 fallow deer, 3,063 organs were tuberculous, 699 whole bodies were confiscated and 2 perished bodies were tuberculous. In 11,041 wild boars, 3,356 organs and 292 heads with tongues were tuberculous; 1,440 whole bodies were confiscated and 2 perished bodies were tuberculous. Most of the infected game were out of the game-park where most of the hunting took place and S. thinks that the incidence of infection was especially increased by letting the eviscerated organs lie on the spots where the game was shot.

—G. HARTMANN (VIENNA).

SAENZ, A. (1937). Retard de la dispersion des germes de surinfection chez les cobayes préparés avec des bacilles tuberculeux morts enrobés dans de l'huile de vaseline. [**Delay in the Dispersion of "Surinfection" Bacilli in Guinea Pigs Vaccinated with Dead Tubercle Bacilli in Liquid Paraffin**]. —*C. R. Soc. Biol. Paris.* **124.** 1161-1164. 2 tables. [8 refs.]

S. injected (subcut.) virulent human and bovine strains of tubercle bacilli into g. pigs after preparing them with dead tubercle bacilli enrobed in paraffin or suspended in saline, using untreated g. pigs as controls. He had previously noted much greater allergy when g. pigs are treated in this way and now shows that, as determined by an examination of the local lymph nodes and the spleen at intervals after the test dose, there is a delay in the dispersion of the test bacilli in the treated animals, particularly those vaccinated with the paraffin treated bacilli.—C. V. W.

GLOVER, R. E. (1936). **Some Observations on the Use of Vaccines in the Protection of Cattle against Tuberculosis.**—*Vet. Rec.* **48.** 1329-1343. [Numerous refs.]

This is a summary of modern investigations into immunization against TB. in cattle. Live vaccines of various origin have been used, but with the majority of these, it has been shown, that they are either not without danger, or else confer but slight immunity. From his own, as well as from the work of other investigators, however, G. considers that the innocuity of BCG has been established, and that, when administered to calves by the intravenous route, it confers a considerable degree of immunity. He outlines the precautions to be observed in the vaccination of cattle, and suggests that vaccination should be restricted to non-reacting calves between the ages of 3 and 6 months. The immunity conferred by BCG is a waning one, and experiments at Cambridge tend to show that revaccination at six-monthly intervals will be required to keep animals free from infection. The advantages and the disadvantages of vaccination are then discussed with reference to the applicability of the method, strength and duration of the immunity, the possible creation of "carrier animals", and the reaction of vaccinated cattle to tuberculin. G. thinks there is no valid reason why segregation and vaccination methods should not be applied concurrently, provided the proper conditions are chosen for each.—N. J. SCORGIE.

FERGUSON, R. L., & CANNON, P. R. (1936). **The Influence of Local Immunization of the Lungs of Guinea Pigs upon Intratracheal Infection with *Bacillus tuberculosis* H.37.**—*Amer. Rev. Tuberc.* **33.** 328-347. 12 figs. on 3 plates. [Numerous refs.]

The authors used phenol-killed culture of *Mycobact. tuberculosis*, strain H.37, for injection (intratrach.) of 70 guinea pigs, 66 of which, with controls, were later infected by the same route with approximately half a million tubercle bacilli of the same strain.

Four vaccinated g. pigs were examined. None showed evidence of tuberculosis and the lungs of 3 killed 39-43 days later showed a definite " mantling " of blood vessels and bronchi by a " collar " of lymphoid cells which was thought to indicate a tissue stimulation or mesenchymal activation. The alveolar spaces contained a few desquamated septal cells, pseudoeosinophiles and lymphoid cells, probably resulting from a reaction to the dead bacilli. The tracheo-bronchial lymph nodes of one g. pig were slightly abnormal but not enlarged.

The histological changes in the treated and control groups after infection were noted at intervals from the 4th to 73rd day. 22 out of 38 controls died and 16 were killed, while of 37 vaccinated g. pigs 10 died and 27 were killed. A fulminating form of tuberculosis was three times as frequent in the control group, and there was greater weight loss, fatality rate and degree of dissemination of tubercle bacilli, the lesions being more spreading than was the case in the vaccinated animals.

Microscopically the lesions of the vaccinated animals were more rapidly evolved, they had a greater tendency to encapsulation, fibrosis and giant cell formation, they were usually less numerous in the liver and the spleen and acid-fast bacteria were more scanty in the lesions.

The survival of 29 vaccinated animals averaged 112 days compared with 59 days for a similar control group of g. pigs.

The authors conclude that direct antigenic stimulation of a portal of entry may increase resistance to infectious agents entering the body by the same route.

—C. V. Watkins.

von Hellens, O. (1936). Tuberkulös smitta från djur till människor. [**The Transmission of Tuberculosis from Animals to Man**].—*Suom. Eläinlääkäril.* **42.** 111-117.

A general account of the question.—P. I. Stenius (Helsingfors).

I. Dalrymple-Champneys, W. (1937). L'incidence de la tuberculose humaine d'origine bovine en Grande-Bretagne. [**Bovine Type Tuberculosis in Man in Great Britain**].—*Bull. Off. int. Hyg. publ.* **29.** 329-336. 4 tables. [14 refs.]

II. Lange, B. (1937). Untersuchungen über den Typus der Tuberkelbacillen bei Lupus vulgaris. [**Types of Tubercle Bacillus in Lupus Vulgaris**].—*Z. Hyg. InfektKr.* **119.** 166-185. 3 tables. [Numerous refs.]

I. Note on the incidence of pulmonary and non-pulmonary tuberculosis in Great Britain and also the relative incidence of human and bovine types of infection.

II. Forty-five cases of human lupus were investigated to identify the type of tubercle bacillus involved. Of these, 20 cases were caused by the human type and 23 by the bovine type of tubercle bacillus. The two remaining ones were mixed infections of the two types. Care was taken to isolate strains of tubercle bacilli on to glycerin-free medium so as to avoid altering their glycerin sensitivity. It is thought that the high proportion of bovine strains encountered resulted from the fact that the patients were all collected from a district where bovine tuberculosis was rife.—E. J. Pullinger.

Richart, A. (1936). Entérite paratuberculeuse et parasitaire des bovidés et hernie kystique de la muqueuse intestinale. [**Johne's Disease, Parasitic Enteritis and Cystic Hernia of the Intestinal Mucosa in a Cow**].—*Bull. Soc. vét. prat. Fr.* **20.** 284-288. 1 fig.

R. describes a case of Johne's disease in which he found cystic hernias of the

intestinal mucosa similar to those that have been described in the pig by MOUSSU and by BALL. Acid-fast organisms and nematode worm eggs were present in scrapings from the cyst walls.—NORMAN HOLE.

GILL, D. A. (1937). **Ovine Bacterial Encephalitis (Circling Disease) and the Bacterial Genus Listerella.**—*Aust. vet. J.* **13.** 46-56. 1 table, 1 graph. [11 refs.]

The literature dealing with the genus *Listerella* is reviewed in some detail, stress being laid on the fact that although it was first recognized as late as 1927 it has already been found responsible for outbreaks in rabbits, g. pigs, gerbilles, fowls, sheep, cattle and human beings. It attacks a wide range of hosts and has been encountered in several widely separated countries suggesting a probable world wide distribution. It causes lesions in a variety of organs, particularly the brain, heart and liver. In human beings, cattle and sheep, cerebral lesions are those commonly encountered and organisms derived from such cases appear to have a predilection for the central nervous system of animals inoculated experimentally.

A table is included setting out the cultural and biochemical characteristics of the various listerella organisms that have been described by different authors.

The latter part of the article deals with further observations made by G. regarding ovine bacterial encephalitis in New Zealand, with particular reference to his attempts to ascertain whether the occurrence of infection in sheep may be related to the presence of first stage *Oestrus ovis* larvae in the nasal cavities.

It is pointed out that since no information is available as to how or whence listerella infections arise and the organisms have not as yet been studied from the immunological point of view, no control measures can be recommended in the meantime.

PETERSON, H. (1936). Sigade punataud 1935. aastal ja esimene profülaktiline süstimine. [**Swine Erysipelas and Preliminary Prophylactic Vaccination in 1935 in Estonia**].—*Eesti loomaarstl. Ring.* **12.** 165-168. 2 tables.

The mortality from S.E. of swine which were treated with serum, was about 5·6%. Owing to the increase of S.E. in 1935, immunization by Lorenz's method was carried out. Out of 23,946 immunized swine only 63 or 0·26% became later affected with S.E.—ELFRIIDE RIDALA (TARTU).

SIKKUT, M. (1936). Lammaste pastörelloosist ja selle esinemisest Eestis. [**Ovine Pasteurella Infection in Estonia**].—*Eesti loomaarstl. Ring.* **12.** 129-142. 2 tables. [7 refs.] [French summary].

An illness occurred on a big farm in lambs from 6-18 months old, 75% of them becoming affected. Sheep of other ages were also affected.

The clinical symptoms of disease in the lambs were languidness, staggering gait, accelerated respiration, constipation alternated with diarrhoea, and prostration, death occurring in 2-5 days. In older lambs and sheep the disease was of a subacute or chronic type. The sheep were apathetic and emaciated. They lay down more than healthy ones, and had a poor appetite, diarrhoea, cough, and a discharge from nose and eyes. The mortality was about 50% in lambs, and about 1-2% in adults. The spread of the disease in the farm was influenced by adverse hygienic conditions in the stall. The P.M. examination revealed signs of haemorrhagic septicaemia and pleuro-pneumonia. The bacteriological examination showed *Pasteurella oviseptica* (*B. bipolaris ovisepticus*) in the organs and blood of the dead lambs and sheep.—ELFRIIDE RIDALA (TARTU).

BOQUET, P. (1937). Sur la toxicité des cultures de coccobacilles de Malassez et Vignal à l'égard des cobayes neufs, des cobayes pseudotuberculeux et des cobayes tuberculeux. [**The Pathogenicity of** *Pasteurella pseudotuberculosis* **for Normal, Pseudotuberculous and Tuberculous Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **124.** 1273-1276. 2 tables. [2 refs.]

B. tested the action upon healthy, pseudotuberculous and tuberculous g. pigs of (1) 10 day old Martin's broth cultures of *P. pseudotuberculosis*, (2) the supernatant of centrifuged one month old Martin's broth cultures of a virulent strain of these bacilli killed by heat (1 hour at 58°-60°C.), and (3) similarly killed saline suspensions of these bacilli grown on agar slopes for 24 hours.

Tuberculous g. pigs were no more sensitive to these test substances than healthy g. pigs, which were slightly sensitive if large injections (intraperit.) were used, but not so when intraven. injection of the supernatant was made. The pseudotuberculous g. pigs were sensitive to the supernatant, but not to the bacillary suspensions following intraperitoneal injection.—C. V. WATKINS.

I. VEDEL, R. (1936). Les bacilles " suipestifer européen " et " suipestifer américain " et les maladies de l'homme dans lesquelles ils sont recontrés. [**Infection in Man with the European and American Strains of** *Salmonella cholerae-suis*].—*Thesis, Paris.* pp. 56. 3 tables. [Numerous refs.]

II. LESBOUYRIES, & BERTHELON. (1937). La salmonellose du porc. [**Porcine Salmonellosis**].—*Rec. Méd. vét.* **113.** 321-339. 4 figs., 1 table.

I. European and American strains of *S. cholerae-suis* are closely related in that their thermostable or " O " antigens are identical, but they differ in their action on dulcite which is fermented slowly by recently isolated European strains and not by the American strains. They apparently differ also in their pathogenicity for man, as human infection with the American type is rare, while the European strain gives rise to a number of conditions, abscesses, arthritis, enteritis, septicaemia and intestinal toxaemia. The origin of these infections is obscure, but they may be related to contact with porcine faeces, or with pork from animals suffering from swine fever.

II. Paratyphoid disease in pigs has an exceedingly loose nomenclature. *Salmonella* tend to localize in the intestine or genital organs, abortion being a common sequel to infection. In young pigs the disease is septicaemic with large round ulcers in the bowel, while the liver is enlarged and friable. The death rate may vary from 10% to 80%.

The authors say that clinically, a diagnosis may be made from a history of abortion, a high mortality in young pigs and a general condition of ill health. There is considerable variation in the agglutination titre of the serum, but 1/100 may be taken as positive of infection. An allergic reaction may be produced by the subcutaneous inoculation of 1 c.c. of a heavy suspension of organisms, but the only certain diagnosis is the P.M. demonstration of *S. cholerae-suis*. In acute cases it may be recovered throughout the body, and from the mesenteric lymph nodes in chronic cases.

Natural infection is probably by the ingestion of faecal material, but the disease may be reproduced experimentally by the feeding or inoculation of cultures. Predisposing factors are malnutrition, especially mineral imbalance, and poor hygiene. Prophylaxis consists of improvement of the hygienic and nutritional conditions and breeding only from sows that are negative reactors to the aggl. test. Vaccines are said to give good results.—A. WILSON TAYLOR.

HERTER, Ruth C., & RETTGER, L. F. (1937). **Toxins of Salmonella Aertrycke.**—*J. Immunol.* **32.** 357-374. 4 tables. [Numerous refs.]

Virulent strains of *S. aertrycke* recently isolated from paratyphoid epizootics in turkeys produced no demonstrable specific toxin *in vitro* for these birds. A non-specific substance, toxic to mice and rabbits was obtained in culture filtrates, and another was obtained by mechanical means from young cells which was toxic also to young turkeys. True toxins, in that they were both toxic and immunological, were isolated by chemical fractionation.—A. WILSON TAYLOR.

THOMSEN, A. (1937). **On the Occurrence of Copulation Infection among Cattle with Infectious Abortion.**—*J. comp. Path.* **50.** 1-9. 2 tables. [2 refs.]

The article first refers to previous observations and experiments which showed that the early view that infectious abortion in cattle was chiefly a coitus disease, could no longer be held. In the series of experiments now reported, 3 bulls, 15 heifers and 4 control heifers were used. The bulls were heavily infected in the prepuce immediately before covering the heifers. 5 heifers aborted, 5 calved normally and 5 did not become pregnant. All 4 control heifers served by a " clean " bull calved normally. T. emphasizes that in spite of massive infection only half the heifers aborted and the experiments are considered to indicate a considerable resistance of cattle at the commencement of pregnancy. No decisive conclusions can be made with regard to transmission by copulation under normal practical conditions, in which the amount of infectious material would presumably be less, but transmission in this way is shown to be possible. In the aborting heifers infected by the bull, the interval between infection and abortion was shown by blood tests to have been very long, averaging 225 days. In another series of experiments in which pregnant cattle were infected by mouth and conjunctiva, it was found that the interval between infection and abortion was inversely proportional to the stage of pregnancy.—S. J. GILBERT.

THOMSEN, A., & RISLAKKI, V. (1936). Teuraskarjan vastavaikutusfrekvenssi tarttuvaan luomistautiin nähden. [**Results of Testing Slaughter Cattle for** *Br. abortus* **Infection**].—*Suom. Eläinlääkäril.* **42.** 105-110. 13 tables. [1 ref.]

The authors carried out about 1,000 blood tests for *Br. abortus* from cattle from different abattoirs in Denmark and Finland. The positive reactions for Denmark were 21·5 to 34·4 % and for Finland 3·5 to 14·3 %.—P. I. S. (HELSINGFORS).

MEUROU, P., & PINEAU, M. (1937). Brucellose à *Brucella abortus bovis* chez la chèvre. [*Br.a.* **Infection in Goats**].—*Bull. Acad. vét. Fr.* **10.** 90-93.

This is claimed to be the first record of natural infection in goats with this organism. In 1934, contagious abortion was diagnosed in a herd of cattle, resulting in their vaccination with a living virulent culture of *Br.a.* In November, 1935, a vaccinated heifer aborted a seven months foetus in the same building in which there were three goats. In February, 1936, one of the latter aborted a three months foetus, and on the following day gave a positive blood reaction to brucella [type not stated]. A typical strain of the bovine type of *Br.a.* was isolated from the milk. Of the other two goats, one gave a positive reaction and the other a negative, but both completed a normal pregnancy. The authors state that the bovine type of *Br.a.* was also obtained from the milk of the aborting heifer, which was assumed to be the source of the infection.—A. WILSON TAYLOR.

RUSSEFF, C. (1936). Die Bedeutung des Retikuloendothelialsystems bei dem Verlauf der Abortus Bang-Infektion bei Laboratoriumstieren. [**The Reticulo-Endothelial System in Brucellosis in Laboratory Animals**].—*Z. ImmunForsch.* **88.** 403-406.

The object of the experiments was to find out whether partial removal or " blockade " of the R.E.S. resulted in a more severe or fatal infection in experimental animals inoculated with *Br. abortus*. G. pigs and mice were inoculated with a broth culture freshly isolated from a bovine foetus. No differences were found in either species between splenectomized animals, controls, and animals which were both splenectomized and given intracardiac injections of indian ink. —E. G. WHITE.

PETERSON, H. (1936). Normal-hobuseseerumi kiirendavast toimest Brucella abortus's infektsioonisse. [**Stimulant Action of Horse Serum on Brucellosis in G. Pigs**].—*Eesti loomaarstl. Ring.* **12.** 258-262. 4 tables. [3 refs.] [French summary].

G. pigs were injected (subcut.) with 0·2 c.c. of *Brucella abortus* suspension containing a thousand million bacteria per c.c., and simultaneously with 0·5 c.c. of normal horse serum. The control g. pigs were injected with *Br.a.* only. Infection was ascertained by means of P.M. examination and blood aggl. tests. The results of the experiments are summarized as follows :– normal horse serum injected simultaneously with *Br.a.* into the g. pig accelerates and aggravates brucella infection ; the agglutination titre of the injected g. pigs was much higher than that of the control animals.—ELFRIIDE RIDALA (TARTU).

I. MAZZA, S. (1936). Caracteres de las *Brucella* aisladas en el norte del país. [**Types of *Brucella* Isolated in Argentine**].—*8th Reun. Soc. argent. Pat. reg. N.* **2.** 801-804. 1 table.

II. MAZZA, S. (1936). Un foco antiguo del país y el más intenso de brucelosis de origen caprino en la provincia de Tucumán. [**Undulant Fever of Caprine Origin in Tucumán Province, Argentine**].—*Ibid.* 825-829.

III. MAZZA, S. (1936). Acción preventiva de las vacunas brucelosas en el hombre. [**Prevention of *Brucella abortus* Infection in Man**].—*Ibid.* 830-832.

IV. MELLO, A. (1936). Nova amostra de *Brucella abortus* isolada em S. Paulo. [*Br.a.* **Isolated from Cattle in Sao Paulo**].—*Rev. Industr. anim.* **3.** 115-120. 2 tables. [Numerous refs.] [English summary].

V. MANZULLO, A. (1935). Infección natural por Brucella melitensis en el cavia pamparum. [**Natural *Br.m.* Infection in Pampas Cavies** (*Cavia pamparum*)].—*Rev. zootéc.* **22.** 133-137. 4 tables. [1 ref.]

I. Description of eighteen strains of *Br.m.* isolated from human cases of caprine origin. One strain (19th) was classified by HUDDLESON as *Br. para-suis.*

II. Description of 20 human cases of brucellosis of caprine origin in the Tafi department of Tucumán Province.

III. This paper deals with the results of the prevention of brucellosis by the Hoechst killed vaccine of *Br. abortus* in the laboratory of the Mission in Jujuy.

IV. This paper deals with the description of the second strain of *Br.a.* isolated in the state of São Paulo, Brazil.

V. From 26 " cuises " (*Cavia pamparum*) captured near La Plata and examined, seven gave a positive serum agglutination (1 : 50). *Br.m.* was demonstrated in one of them.—S. TORRES.

I. MEYER, D. B., & HUDDLESON, I. F. (1936). **The Vaccinal Immunization of Cattle for Bang's Disease.**—*Tech. Bull. Mich. agric. Exp. Sta.* No. 153. pp. 25. 6 tables. [9 refs.]

II. ROSSI, P. (1937). Prémunition du bétail contre les brucelloses et contamination humaine. [**Premunition against Brucellosis and Risk of Human Infection**].—*Bull. Soc. vét. prat. Fr.* **21.** 21-26 and 52-62.

III. MOUTAUX, M. (1937). Au sujet de vaccins vivants contre l'avortement epizootique. [**Live Vaccines against Bovine Brucellosis**].—*Ibid.* 51-52.

IV. VELU, H., & ZOTTNER, G. (1937). Les injections de brucella en excipients gras et problèmes connexes. [**Vaccination against Brucellosis with the Aid of Fatty Exipients**].—*Arch. Inst. Pasteur Algér.* **15.** 70-96. 4 tables. [Numerous refs.]

I. The authors state that the value of a vaccine against contagious abortion should be based on the protection it affords against infection instead of against the chief symptom of the disease. The vaccine used in this investigation was a live non-virulent culture of *Br. abortus*, which even in large and repeated doses did not produce agglutinins in the blood serum of cattle. The degree of active immunity afforded by the vaccine could be estimated by the opsono-cytophagic test. Statistical analysis of the results of a 5-year investigation, involving a considerable number of cattle, indicate that the vaccine conferred a significant degree of resistance to infection. About 10% of the vaccinated animals, however, did not develop a satisfactory immunity. The factors which might lead to a too favourable interpretation of the results of vaccination are described. [See also *V. B.* **7.** 517].

II. R. cites several cases of undulant fever in man in which there was a strong suspicion that infection was transmitted by animals vaccinated with live strains of *Br.a.* There is no restriction in France on the preparation, sale and use of bacterial cultures, and R. pleads for a strict control of all veterinary vaccines likely to transmit infection to man. There follows a discussion by several speakers on the efficacy and on the dangers of live *Br.a.* vaccines.

III. A plea for uniformity in the preparation of living vaccine, presumably from one standard strain of the organism.

IV. This article is mainly a summary of work already published by the authors. [*V. B.* **5.** 438, **6.** 215 *bis*, 599 *bis*, 795, and **7.** 108 and 212 *bis*]. Further observations are given on the allergic and agglutinin responses of animals previously vaccinated with brucella organisms in a fatty excipient.—N. J. SCORGIE.

MCCLUNG, L. S. (1937). **Studies on Anaerobic Bacteria. X. Heat Stable and Heat Labile Antigens in the Botulinus and Related Groups of Spore-Bearing Anaerobes.**—*J. infect. Dis.* **60.** 122-128. [Numerous refs.]

Over 160 strains of *Cl. botulinum* were examined and it was found that the grouping of strains obtained by the agglutination test depended on the heat-labile antigen. That all the strains appeared to have the same heat stable antigen was shown by cross and absorption tests. The antigens would appear to be specific but some cross reaction was found with *Cl. sporogenes*.—A. WILSON TAYLOR.

HENDERSON, D. W. (1937). **A Serological Analysis of the Protective Substances in Specific Antibacterial Sera which Control Experimental Infection with** *Cl. oedematis maligni* (*Vibrion septique*).—*Brit. J. exp. Path.* **18.** 224-238. 7 tables. [Numerous refs.]

The presence of a heat-labile, alcohol-sensitive antigen in *Cl. septique* is demonstrated. This appears to be related to, or identical with, the flagellar " H "

antigen and when injected into rabbits gives a serum which protects mice against experimental infection. A comparison is also made between the protective values of antibacterial and antitoxic sera.—P. S. WATTS.

PRIGGE, R. (1936). Experimentelle Untersuchungen ueber die serologischen Eigenschaften des Fraenkelschen Gasbazillus [*B. perfringens*]. [**Experimental Observations on the Serological Behaviour of** *Clostridium welchii*]. —*Z. ImmunForsch.* **89.** 477-483. 3 tables. [4 refs.] [Copied *verbatim* from *Bull. Hyg. Lond.* **12.** 308. Signed G. S. WILSON].

Studying two strains, Prg. 2L and Prg. 187, of *Cl. welchii*, the author found a considerable discrepancy between the haemolytic dose and the 50 per cent. lethal dose for mice inoculated intravenously. With Prg. 2L the haemolytic dose was 1·7 times the 50 per cent. lethal dose whereas with Prg. 187 it was 17 times this dose. From this it was concluded that, besides the so-called alpha toxin which is responsible for haemolysis, there was also a zeta toxin which is mainly responsible for the lethal action on the animal organism. Neutralization experiments confirmed this conclusion, indicating that the zeta toxin, predominant in Prg. 187, was of very much greater importance than the alpha toxin in determining the death of inoculated animals. From the practical point of view the author regards it as important that an antitoxic serum should contain a high content of zeta antitoxin. He further points out that the measurement of the zeta antitoxin can be carried out only with *welchii* filtrates that are poor in alpha toxin.

SEDLMEIER, H. (1936). Kulturelle und experimentelle Untersuchungen über die Aetiologie der Aktinomykose des Rindes. [**The Aetiology of Bovine Actinomycosis**].—*Z. InfektKr. Haustiere.* **50.** 129-164. [Numerous refs.]

Of 59 cases of actinomycosis in the ox, 34 involved the tongue and cheek and 25 the jawbones. Twenty-seven strains of *Actinobacillus lignieresi* were recovered from the soft structures and 21 strains of *Streptothrix israeli* from the bones. A full account of the morphology and cultural character of the two organisms is given. Intraperit. inoculation of cultures of the actinobacillus into rabbits or g. pigs gave rise to a fibrinous exudative peritonitis and the formation of abscesses containing granules in the liver and lungs. Similar lesions were caused by the streptothrix but they were not so widely disseminated. The histology of the lesions caused by the two organisms was almost identical. Animals affected with disease of the tongue gave an allergic reaction to a glycerin broth extract of the actinobacillus and also to mallein but not to tuberculin.—S. J. EDWARDS.

HAUPT, H. (1935). Zur Systematik der Bakterien. Die für Mensch und Tier pathogenen gramnegativen alkalibildenden Stäbchenbakterien (Aerobaktereae Pribram 1929 em.). [**Classification of the Bacteriae**].—*Ergebn. Hyg. Bakt.* **17.** 175-230. [Numerous refs.]

[It is not desirable to have too many systems of bacterial classification, and as the present one is in many respects not in conformity with current opinion it can only add to confusion]. The bacteria dealt with are those Gram-negative rods which are pathogenic for man and animals – some non-pathogens are also included – which are considered by PRIBRAM [*J. Bact.* (1929). **18.** 361.] to fall in the family Aerobacteraceae. The proposed division is as follows :– Family – Aerobacteraceae ; Tribes – Aerobactereae (Sub-tribes – Cloacinae, Alkaligeninae, Aerobacterinae, Salmonellinae), Pasteurelleae.

The sub-tribe Cloacinae includes a genus Cloaca, which contains the gelatin liquefying organism isolated from birds (*Bact. cloacae*) and other less known varieties, a genus *Proteus* containing *P. vulgaris* and another genus *Bookeria*.

The sub-tribe Alkaligeninae includes two genera, *Alkaligenes* and *Brucella*. The former contains *Bact. alkaligenes*, found in intestinal contents, and *Brucella bronchiseptica* of dogs, whilst the latter genus contains the caprine, bovine and porcine varieties of *Brucella*.

The sub-tribe Aerobacterinae is divided into three genera, *Klebsiella*, which contains Friedländer's pneumobacillus, *Aerobacter*, containing *Bact. aerogenes*, and *Escherichia*, which contains the many varieties of *Bact. coli*.

The sub-tribe Salmonellinae is divided into two genera, *Salmonella* and *Shigella*. The genus *Salmonella* is subdivided on conventional lines according to antigenic structure, although those organisms falling into the sections A, B, C, etc., as laid down by the Salmonella Subcommittee of the International Society for Microbiology, are named as special sections, *e.g.* Asalmonia, Besalmonia. The names of some of the species are altered, *e.g. Salmonella abortus equi* is known as *S. equina*. A useful table of the antigenic structure and some biochemical reactions of the different species in this genus is given. The genus *Shigella* contains the dysentery bacilli and also an organism named *Shigella pseudotuberculosis*. The description of this organism coincides with that of *Pasteurella pseudotuberculosis* (*B. pseudotuberculosis rodentium*), but among the synonyms given are *Corynebacterium rodentium* and *Corynebacterium pseudotuberculosis*, both of which are credited to BERGEY. [Two well defined species of the genus *Corynebacterium*, namely, *C. pseudotuberculosis murium* or *C. murium* and *C. pseudotuberculosis ovis* or *C. ovis* have no association with the organism described here. The organism described as *Shigella pseudotuberculosis* is generally called *Pasteurella pseudotuberculosis* and has a serological relationship with *Pasteurella pestis*, the plague bacillus (see SCHUTZ. (1932). *Brit. J. exp. Path.* **13.** 289). *Bact. pfaffi* is apparently identical with *Pasteurella pseudotuberculosis*].

The tribe Pasteurelleae is to be dealt with later but it is proposed to divide it into three genera, namely, *Haemophilus*, including the influenza bacillus of Pfeiffer and the pertussis bacillus of Bordet and Gengou, *Pasteurella*, including *Past. septica*, *pestis* and *tularensis*, and *Actinobacillus*, which, contrary to current usage, includes *Pfeifferella mallei* and *whitmori*.—R. LOVELL.

MIKULASZEK, E. (1935). Bakterielle Polysaccharide. [**Bacterial Polysaccharides**]. —*Ergebn. Hyg. Bakt.* **17.** 415-496. 7 tables. [Numerous refs.]

A general review of knowledge gained by many workers on polysaccharides extracted from bacteria is given. The review is divided into several sections dealing with the physical and chemical properties of bacterial polysaccharides, the methods employed in their preparation, their serological reactions and any association they may have with capsule formation, virulence and other characteristics of the parent bacillus. Bacterial polysaccharides are amorphous, soluble in water, devoid of protein, and are extracted from suspensions of bacteria by primary acid or by primary alkali treatment. In most cases they appear responsible for serological specificity – sometimes type specificity, sometimes group specificity – although in some cases the extract derived by primary acid treatment may not correspond serologically with that extracted after primary alkali treatment. Although these polysaccharides are usually lacking in antigenicity, they may combine with immune sera to form a precipitate and to fix complement. They may engender the Schultz-Dale reaction in an extirpated uterus, produce an allergic response and also an anaphylactic shock in passively immunized g. pigs.

In addition to the general discussion and review, specific details are given of the work carried out by different authors on the polysaccharides derived from many different species of bacteria. A summary of this part is given in tabular form,

dealing with the method of extraction employed, the chemical and physical properties of the extract and their serological and anaphylactic characters. A list of authors is given. The bacteria dealt with include pneumococci, haemolytic streptococci, Friedländer's bacilli, members of the salmonella group, dysentery bacilli, the genus *Proteus*, cholera vibrios, tubercle bacilli and certain yeasts.

There is a very full bibliography.—R. LOVELL.

SHAPIRO, A., SPIEGELMAN, S., & KOSTER, H. (1937). **A Rapid Method for the Study of Genetics in Large Populations.**—*J. Genet.* **34.** 237-245. 6 figs. [3 refs.]

The authors studied the occurrence from a genetic standpoint of " rough " and " smooth " colonies in an " unstable " culture of *Salmonella typhi-murium*. It was found that a " rough " colony when plated out gave rise to both " rough " and " smooth " colonies, whilst a " smooth " colony gave rise to " smooth " colonies only. Portions of a "rough" colony in the parent culture were then streaked out on plates of heart infusion agar. After incubation at 37°C. for 24 hours, 20% of the colonies present were of the " smooth " type ; when incubation was carried out for 48 hours at 27° C. the corresponding figure was 37%. The distribution of values about the mean showed clearly that the occurrence of " smooth " colonies from a " rough " parent colony was a biological constant. The percentage of "smooth" colonies depended only on the incubation temperature, and not on the history of the cell from which it is derived.—N. J. SCORGIE.

VAN LOGHEM, J. J. (1937). Les microbes commensaux. [**Commensal Bacteria**]. —*Ann. Inst. Pasteur.* **58.** 609-624. 3 diagrams. [Numerous refs.]

Most of the commensal bacteria are more or less harmless, only infecting their host when the resistance of the latter is lowered, or they are present in excessive numbers. They also differ from organisms that depend for infection almost solely on their own virulence in that they do not tend to disappear after an epidemic, but are capable of adjusting themselves to new conditions.—A. WILSON TAYLOR.

MERRILL, M. H. (1936). **Effect of Purified Enzymes on Viruses and Gram-Negative Bacteria.**—*J. exp. Med.* **64.** 19-28. 1 fig., 6 tables. [10 refs.]

A report of experiments made with purified proteolytic enzymes on four animal viruses and ten species of Gram-negative bacteria. The viruses differed in their resistance to inactivation by the enzymes used, *viz* crystalline trypsin and chymotrypsin. Equine encephalomyelitis virus was inactivated by chymotrypsin but not by trypsin ; vaccinia was slowly inactivated by trypsin but was not affected by chymotrypsin ; pseudorabies virus was inactivated by both enzymes, and swine influenza virus by neither. Ten strains of living Gram-negative bacteria resisted the action of both enzymes but when killed were rapidly digested.

Some viruses, therefore, behaved like proteins in that they appeared susceptible to the action of proteolytic enzymes. The bacteria tested behaved like other known living organisms in that they resisted digestion. The fact that some viruses are inactivated may indicate that they are non-living.—A. ROBERTSON.

SAENZ, A. (1937). Dispersion des bacilles de surinfection inoculés par voie intradermique chez les cobayes préparés avec des bacilles tuberculeux morts enrobés dans l'huile de vaseline. [**Dispersion of Surinfection Bacilli Injected Intradermally into Guinea Pigs which had been Prepared with Dead Tubercle Bacilli in Liquid Paraffin**].—*C. R. Soc. Biol. Paris.* **125.** 98-101. [3 refs.]

S. prepared twelve g. pigs by injection (subcut.) of a killed bovine strain of tubercle bacilli enrobed in liquid paraffin. At the 51st day, half these animals received an intradermal test dose of a human strain of tubercle bacilli, and the other half a test dose of a bovine strain of tubercle bacilli. In the treated groups a small red oedematous papule formed in 24 to 48 hours. About the 5th day this became a lentil sized necrosed nodule. At the 15th day the reaction commenced to recede gradually to pin-head size, forming a scab which dropped off leaving a small crater. The controls first showed local reaction about the 8th day which progressed to ulceration about the 15th day, and after 24 to 27 days formed a scab. P.M. examinations were made of both treated groups and controls at intervals up to 39 days after the test dose. The lungs of all the treated animals remained healthy, but 4 of the controls had infected lungs at the 39th day. The spleen was infected at the 13th day in one case and regularly after the 25th day in the controls, but in the treated groups all the spleens were healthy at the 39th day except one case of infection at the 25th day.—C. V. Watkins.

Dreyer, G., & Campbell-Renton, Margaret L. (1936). **A Quantitive Study of the Action of Ultra-Violet Light on Bacteria.**—*Proc. roy. Soc.* Ser. B. **120.** 447-472. 6 text figs., 2 figs. on 1 plate, 7 tables. [11 refs.]

Previous investigation having shown that different spectral lines exert some selectivity in their biological effects, the authors tested the varying effect of these lines on different species of bacteria before and after treatment with erythrosin in a concentration of 1 : 16,000. The technique of preparing the bacteria for exposure on agar covered glass plates to a vacuum mercury lamp is detailed. About 10 different spot exposures could be made on each plate at wave-lengths varying from 6000 to 2000Å. The exposures were read by means of a special " reading machine " after incubation for 22 hours at 37°C. in a moist chamber, the results being expressed as curves of percentage growth plotted against the logarithms of the times of exposure. The shape of the curves for any given microbe was always consistent, irrespective of the wave-length used and treatment by erythrosin did not alter its shape. In the case of certain bacteria the curves did not correspond to the systematic and serological classification.

The spectral line 2655Å was always most lethal, followed in order by lines 2536, 2804, 2482 and 2700Å. In the case of erythrosin-treated bacteria all Gram-positive species were proved more sensitive to light in the long wave-lengths than Gram-negative species. In comparison, the curves for the disinfectants tested – lysol, phenol and formalin – showed a stimulation of the growth of two species of bacteria in the higher dilutions.—C. V. Watkins.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Meleney, H. E., & Frye, W. W. (1937). **The Effect of Direct Animal Passage on the Pathogenicity of *Endamoeba histolytica* for Kittens.**—*Amer. J. Hyg.* **25.** 313-326. 2 tables. [10 refs.]

A strain was obtained from a region in which there was a high incidence – presumably of human origin – of *E.h.* but an absence of acute amoebic dysentery ; this strain showed a low degree of pathogenicity for kittens. Another strain associated with amoebic dysentery was obtained from another region and showed a high degree of pathogenicity in kittens. As prolonged cultivation did not reduce the virulence of these strains in kittens the question arose as to whether the degree of virulence

was an inherent characteristic which would persist in spite of attempts to change it by manipulation. Each of the strains which had maintained a constant degree of virulence over a period of three years in culture were passed through seven dogs and were then artificially cultured. It was found that each strain became more active in dogs by direct dog-to-dog transfer. After the seventh transfer kittens were inoculated with material removed directly from infected dogs and the pathogenicity was found to have increased. The two strains from the seventh passage dogs were once more isolated in culture and after some days and again after several months they were again inoculated into kittens when the virulence of each strain was found to be lowered. Virulent haemolytic streptococci were added to washed amoebae and inoculated into kittens, but there was no increase in the pathogenic activity of the amoebae. The results of these experiments lend support to the view that strains of *E.h.* from different sources exhibit great differences in pathogenicity and that these are inherent in the amoebae themselves, and, further, that the increase in pathogenicity which results from direct animal passage is brought about by fluids associated with intestinal lesions which afford a more favourable medium for the amoebae.—C. Horton-Smith.

Dubois, C., & Vigouroux, M. (1937). Les quatre premiers cas autochtones de leishmaniose canine observés dans le Gard. [**First Cases of Canine Leishmaniasis Seen in Gard Dept., France**].—*Bull. Acad. vét. Fr.* **10.** 135-140. [4 refs.]

Four cases are described in three of which the parasites were found, two of them being fatal.—A. Wilson Taylor.

Khodukin, N. J., Sofieff, M. S., & Kevorkoff, N. P. (1936). Sur l'identification des différentes souches de leishmanies. (Problème de l'agent pathogène des leishmanioses). [**Identification of Strains of Leishmania**].—*Ann. Inst. Pasteur.* **57.** 487-515. 9 tables.

An attempt to identify different strains of leishmania by the aggl. test, agglutinin absorption test and by fixation of complement showed that some species, *e.g.*, *L. canis*, *L. donovani*, etc., have apparently a common antigen. *L. brasiliensis* is the only one that can be identified by complement-fixation and the agglutinin absorption test.—A. Wilson Taylor.

Ridala, V. (1936). Hanede neerukoktsidioos. [**Renal Coccidiosis in Geese**].—*Eesti loomaarstl. Ring.* **12.** 177-199. 14 figs. on 3 plates. [Numerous refs.] [English summary].

Fourteen carcasses of goslings, 5-11 weeks old, that had died of renal coccidiosis were examined. The morbidity of goslings in the infected farms was large, and the mortality was 100%. Enormous numbers of oocysts of *Eimeria truncata* were present in the kidney tissue and the contents of the ureters of all goslings examined, and varying numbers were present in the rectum. The kidneys were enlarged and there were many white streaks and spots (tubules filled with urates). All stages were present in sections from the kidneys and there was dilation of the tubules and a desquamation and atrophy of the epithelium. Surrounding the affected tubules there was a round-celled infiltration of varying density. No parts of the epithelium of the intestines and no other organs besides the kidneys showed any developmental forms of the parasites. The measurements of 500 oocysts in the smears from the kidneys and contents of the ureters of 10 goslings were 14·4 to 24·96 by 12·6 to 18·9μ. Sporulation of *E.t.* resembled that of *E. stiedae*.
—Elfriide Ridala (Tartu).

I. JAMES, S. P., & TATE, P. (1937). **Preparations Illustrating the Recently Discovered Cycle of Avian Malaria Parasites in Reticulo-Endothelial Cells.** —Copied *verbatim* from *Trans. R. Soc. trop. Med. Hyg.* **31.** 4-5. 7 figs. on 1 plate. [6 refs.].

II. ANON. (1937). **New Light on the Life-Cycle of the Malaria Parasite.**—*Lancet.* **232.** 764. [3 refs.]

I. Colonel JAMES who was invited by the PRESIDENT to describe the exhibit, said it was concerned with the life cycle of the avian malaria parasite which Professor BRUMPT (1935 and 1936) found in domestic fowls in Ceylon in 1935 and to which he gave the name *Plasmodium gallinaceum.* This parasite, like other members of the family Plasmodiidae, has a schizogonic cycle of development in the circulating red blood corpuscles of the vertebrate host and a sporogonic cycle of development in the insect host which, as Professor BRUMPT showed is the yellow fever mosquito *Stegomyia fasciata* (*Aëdes aegypti*). But it appeared from the work illustrated by the exhibit that it has, in addition, a hitherto unrecognized schizogonic cycle of development in monocytes and in reticulo-endothelial cells of the spleen, liver, and kidneys; and particularly, in certain cases, in the reticulo-endothelial cells which line the capillaries of the brain. The first step in this finding was that in January this year Colonel JAMES observed in the cytoplasm of endothelial cells from the spleen and heart blood of a chicken which had died from the malarial infection, non-pigmented schizogonic phases of a parasite which bore little or no resemblance to the pigmented schizogonic stages of the malaria parasite as seen in red blood corpuscles. The phases that had been observed were shown to Dr. WENYON and were called, provisionally, " *x* bodies ". Previously HUFF and BLOOM (1935) of the University of Chicago had found what seemed to be the same phases in various types of cells of the bone marrow of birds infected with *P. elongatum*; and RAFFAELE (1936) of the Marchiafava Institute for Malariology in Rome had found some of the phases in *P. elongatum* and also in the reticulo-endothelial system of birds infected with *P. relictum.* Thus it appeared that observers working independently in different countries on three different species of avian plasmodia have found that at any rate some malaria parasites have an additional cycle of development in the vertebrate host which was previously unknown. As regards human malaria parasites, the occurrence of such a cycle in " tissue cells " instead of in red blood corpuscles was postulated by several investigators (JAMES, 1931) some years ago in an endeavour to explain why quinine is ineffective in preventing attacks of malaria due to the bites of mosquitoes and in preventing the relapses and recurrences which are such a troublesome feature of the human disease. In this connexion Colonel JAMES and Dr. TATE repeated on chickens infected with *P. gallinaceum* some of the prophylactic and curative clinical trials with quinine and the synthetic anti-malarials which were made on other avian and human plasmodia in 1931 and later years. The results seemed to them to indicate that the discovery of the endothelial cell cycle of the parasite opens up some interesting problems for chemo-therapeutic research and may help to explain some of the clinical, therapeutic and epidemiological problems of malaria which have not yet been solved. Several of the preparations shown were from chickens which had been cured temporarily of the peripheral blood infection by the administration of two or more doses of quinine but had died later as a result of the development, in the cytoplasm of endothelial cells of blood vessels in the brain, of large schizonts which completely blocked the capillaries.

Colonel JAMES remarked also that the discovery, apart from its probable bearing on clinical and therapeutic problems, raised a question of interest to systematists in that it did not seem correct any longer to define the Plasmodiidae as a family

in which the whole of the vertebrate cycle of development occurs in the circulating red blood corpuscles. *P. gallinaceum* is evidently a parasite which, in the vertebrate host, has a cycle of development characteristic of members of the family Plasmodiidae ; but in addition, it has a cycle of development resembling, in some respects, the schizogonic cycle in endothelial cells which is ordinarily described as being characteristic of members of the family Haemoproteidae. A preliminary note on these observations has already appeared in *Nature* (JAMES and TATE, 1937).

II. An annotation to earlier work by JAMES [*Proc. R. Acad. Med. Amst.* **34.** 1424. (1931).] and to recent research with special reference to I.

DUPONT, O. (1936). Premunição contra a piro e anaplasmose-Acclimação e adaptação das raças aperfeiçoadas ao nosso meio. [**Premunition against Piroplasmosis and Anaplasmosis in Brazil**].—*Rev. Dep. nac. Prod. anim. Rio de J.* **3.** 189-195. [French summary].

A recapitulation of the author's system of immunizing imported cattle against " tristeza " (piroplasmosis and anaplasmosis), which he advocated in 1917. Indigenous " carrier " cattle are brought in from tick-infested country and are kept tick-free for a year, after which their blood is taken and used for immunization, three doses of 10 c.c. each being given at 15-20 day intervals. The first is stored for 15 days in a refrigerator before use, the second dose for 12 days and the third dose consists of fresh blood. After the inoculations are finished the cattle are then placed on tick infected pastures.

D. also advised about the feeding of premunized animals.—S. TORRES.

CRAWFORD, M. (1935). **Tick-Borne Diseases of Cattle in Ceylon.**—*Trop. Agriculturist.* **84.** 124-130.

A popular description of infection and early symptoms of the diseases caused by *Babesia bigemina, Anaplasma marginale* and *Theileria mutans*.—E. E. JELBART.

RASTEGAIEFF, E. F. (1936). Essais de transmission de la spirochaetose des poules au moyen des gamasides " Dermanyssus gallinae ". [**Attempts to Transmit Avian Spirochaetes by** *D.g.*].—*Ann. Soc. belge Méd. trop.* **16.** 513-520. [17 refs.]

The transmitters of fowl spirochaetosis caused by *Spirochaeta gallinarum*, are ticks belonging to the sub-family Argasidae. *A. persicus* is widely distributed over parts of Russia. During warm and arid summers the ticks multiply enormously in the poultry houses and are capable of infecting fowls at all stages of their development. Besides the argasids the gamasid *D.g.* has also been accused of transmitting fowl spirochaetosis, but R., after repeated attempts, failed to transmit *Sp.g.* by *D.g.*—C. HORTON-SMITH.

BEVERIDGE, W. I. B. (1936). **A Study of** *Spirochaeta penortha* **(N. sp.) Isolated from Foot-Rot in Sheep.**—*Aust. J. exp. Biol. med. Sci.* **14.** 307-318. 8 figs., 2 tables. [14 refs.]

An organism previously reported by B. as being constantly present in foot-rot lesions has been isolated in pure culture and is here described in detail. It was not possible to reproduce foot-rot with cultures but the organism is thought probably to have some aetiological significance. It is a Gram-negative slender filament which is straight or curved but ordinarily not wavy. Nevertheless it is considered to be a spirochaete as it is flexible and motile in the absence of demonstrable flagella. The name *Spirochaeta penortha* is proposed. It grows on the surface of blood agar in an anaerobic atmosphere containing CO_2. In semi-

fluid media growth is favoured by the addition of a piece of raw potato. *Sp. penortha* in pure culture is destroyed by exposure to air but it survives much longer in the presence of *Staphylococcus aureus*. It is not pathogenic for rabbits, g. pigs or mice. Specific agglutination was demonstrated in high dilution with prepared antisera.

DISEASES CAUSED BY VIRUSES.

I. SCHLESINGER, M., & GALLOWAY, I. A. (1937). **Sedimentation of the Virus of Foot-and-Mouth Disease in the Sharples-Super Centrifuge.**—*J. Hyg., Camb.* **37.** 445-462. 2 tables. [12 refs.]

II. GALLOWAY, I. A., & SCHLESINGER, M. (1937). **Purification and Concentration of the Virus of Foot-and-Mouth Disease by Combined Centrifugation and Ultrafiltration Methods.**—*Ibid.* 463-470. 2 figs., 2 tables. [3 refs.]

I. This is a new technique for the measurement of the rate of virus sedimentation. The virus suspension is centrifuged in a closed cylinder which is lined with a thin layer of agar-gel. The potency of a F. & M. disease virus suspension may be reduced by 90-99% by spinning for 3 minutes at 31,000 r.p.m.

The diameter of the virus particle is calculated from the sedimentation rate as $20m\mu$. After prolonged centrifugation a sedimentation equilibrium is attained; from this equilibrium the weight of a single virus particle is estimated as 1×10^{-17} g. By sedimenting the virus in sucrose and sucrose-salt solutions, the specific gravity of the virus is shown to be about 1·4.

II. F. & M. disease virus may be concentrated on filter candles coated with acetic acid collodion. The increase in titre always corresponds to the reduction in volume of the suspension, and thus the degree of concentration of the virus is limited by this factor. With samples of both unpurified and purified (protein-free) virus suspensions a hundred-fold increase in titre may be effected.

A purified virus with a titre of 10^{-8} (titre of original material 10^{-6}) has been obtained by washing the virus once in the agar-lined Sharples-Super centrifuge and then repeatedly on graded collodion membranes (A.P.D. $25m\mu$). A further concentration may be obtained by a final passage of the virus through the acetic acid collodion filter candles.—E. C. HULSE.

SCHANG. (1936). La transmision de la fiebre aftosa por los pajaros e insectos. [**The Transmission of Foot and Mouth Disease by Insects**].—*Rev. Med. vet., B. Aires.* **18.** 532-533.

For one month S. kept a group of calves 50 metres from an enclosure containing infected animals, and 30 metres from the manure heap of these animals. No symptoms were observed among the calves until they were transferred to the infected group when symptoms rapidly appeared.

Possible local carriers are wild birds, flies and toads. S. states that the normal route of transmission of F. & M. disease is by direct contact, harness and common boundaries, and he considers that insects play no appreciable part.—J. A. PASFIELD.

BENAZZATO, L. (1936). Contributo allo studio e alla cura della "peste equina" nel Tigrai (A. O. I.) [**Treatment of African Horse-Sickness in Tigre, Abyssinia**].—*Clin. vet., Milano.* **59.** 755-762. 3 figs. 1 table.

B. studied epidemics of the disease in Eritrea. Imported animals are most readily affected and horses are most subject to infection, though mules and donkeys are attacked. He proves that the *Anopheles* mosquito is not always the vector, as

outbreaks have occurred in the absence of mosquitoes. He attributes the spread of infection to small birds, called locally " Cirna ", that perch on and peck horses, mules and donkeys.—S. F. J. HODGMAN.

EBERBECK. (1937). Die pockenartigen Erkrankungen des Pferdes. [**Pox-Like Diseases of Horses**].—*Z. Veterinärk.* **49.** 26-30. [13 refs.]

German workers differentiate three distinct diseases, horse pox (*Variola equina*), infectious pustular stomatitis and vesicular genital exanthema (Bläschenausschlag).

In two outbreaks of infectious pustular stomatitis, E. was able to transmit the disease by inoculation on to the eyes of rabbits causing epithelial proliferations in which Guarnieri bodies were found.

According to veterinary reports of the German army contagious pustular stomatitis occurred during 24 of the last 34 years. It was nearly always benign and lasted from one to three months in a unit, causing each affected horse to be away from work for two to four weeks. The disease is said to be of a malignant type in the Russian army.

The former method of immunization by rubbing the saliva from the affected horses on to the oral mucous membrane of healthy horses is unsatisfactory. It is less dangerous and more efficacious to rub the saliva on the skin of the neck after scarification.—F. FREUDENBERG (BERLIN).

WEIDLICH, N. (1936). Stomatitis et Dermatitis pustulosa contagiosa bei Serumtieren. [**Contagious Pustular Stomatitis and Dermatitis in Serum Producing Horses**].—*Prag. tierärztl. Arch.* **16.** 219-223. 3 figs. [9 refs.]

An outbreak of contagious pustular stomatitis broke out in a stable of 134 equines of which 99 were serum producers. During 2 weeks, 52 horses and 7 mules became affected (one half of the horses and one third of the mules), pointing to a greater susceptibility of horses. The lesions appeared chiefly on the mucous membrane and skin of the mouth, and more rarely on the skin of the neck and chest, consisting of nodules which broke down after one to four days and healed up after eight days, leaving small scars. Some animals had slight fever, but most had not. The appetite and general condition were not upset.

—F. FREUDENBERG (BERLIN).

DOERR, R., & SEIDENBERG, S. (1937). Die Konkurrenz von Virusinfektionen im Zentralnervensystem (Phänomen von Fl. Magrassi). [**Concurrence of Virus Infections in the Central Nervous System (Magrassi's Phenomenon)**]. —*Z. Hyg. InfektKr.* **119.** 135-165. 7 tables. [11 refs.]

If rabbits are inoculated intracorneally with an encephalitic strain of herpes virus and receive four to five days later a second injection intracerebrally, no nervous symptoms result and the animal is subsequently immune. If the second injection is given into the other cornea instead of intracerebrally no protection occurs and the animals die of encephalitis. To explain the latter observation the authors postulate that the first injection of virus renders the afferent nerves incapable of centripetal conduction of virus. The second intracorneal injection is, therefore, unable to reach the brain and, therefore, cannot produce immunity to encephalitis whereas intracerebral inoculation of virus brings about direct contact of virus with the brain tissue.—E. G. WHITE.

I. ANON. (1936). Cunde pavorosamente la epidemia que ataca al ganado yeguarizo. [**Alarming Spread of Equine Encephalomyelitis in the Argentine**].—*La Res.* **4.** 3047-3048.

II. LERENA, C. A. (1936). La encéfalo-mielitis o meningitis cerebro espinal de los caballos. [**Encephalomyelitis and Cerebrospinal Meningitis in Horses**].—*Rev. zootéc.* **23.** 172-176.

III. ROSENBUSCH, F. (1936). Estudios etiológicos de la epizootía de encéfalomielitis de los equinos en la Argentina (1933). [**Equine Encephalomyelitis in the Argentine in 1933**].—*8th Reun. Soc. argent. Pat. reg. N.* **2.** 572-576.

I. Brief information about the spread of the disease in the country and the prophylaxis.

II. A description of the classic disease, treatment and prophylaxis, without anything new.

III. Experimental observations indicate that the disease of horses in the Argentine (1933), is similar to the encephalomyelitis described by MEYER, HARING and HOWITT [*V. B.* **5.** 716].—S. TORRES.

I. DOYLE, L. P. (1937). **Midwinter Equine Encephalitis.**—*J. Amer. vet. med. Ass.* **90.** 786-788. 2 figs.

II. BAILLY, J. (1937). A propos de l'encéphalomyélite infectieuse des équidés. [**Equine Encephalomyelitis**].—*Maroc med.* **17.** 146-150 and 193-197.

I. Sporadic cases of the disease are recorded. In the outbreak reported, two out of 11 horses were affected, developing violent nervous symptoms before death. One brain was examined. Microscopically there were found marked congestion, oedema and haemorrhages. There were two softened yellowish areas in the cerebral hemispheres. The microscopic changes, consisting mainly of perivascular lymphoid cell infiltration, occurred chiefly in the cerebrum.

II. A brief historical review is given and the geographical distribution is mentioned. A detailed description of the symptoms is included. There is never sudden death as in Aujeszky's disease or rabies. The pathology of the disease differs little from that of herpes, Aujeszky's disease or rabies. The predominant lesion is a perivascular infiltration. The distribution of the virus in the nervous system is discussed. The disease is contagious and infectious, sometimes epizootic and sometimes enzootic. The course in various small animals after artificial inoculation is described. The g. pig and the rabbit are useful experimental animals. Modes of artificial infection are discussed. Infection through the nasal membrane, the corneal surface, and by the digestive tract occurs easily.

In the United States transmission has been considered to have been by mosquitoes. Some experimental evidence has also been produced. Cases have, however, been recorded in Nevada where there were no mosquitoes, and in France the disease cannot be correlated with the distribution of mosquitoes. The question of migratory birds as vectors is considered.

Comparison is made between the properties of this virus, rabies virus and the virus of Aujeszky's disease.

The question of the plurality or entity of the virus is also discussed, and it is considered that insufficient evidence is available to prove the existence of several types. The virulence is, however, extremely variable.—F. H. MANLEY.

HURST, E. W. (1937). **An Effect of Guinea-Pig Passage on the Virus of Rabies.** —*Brit. J. exp. Path.* **18.** 205-212. 3 tables, 1 chart. [7 refs.]

The inoculation (intraven. and intramusc.) of infective g. pig brain that had been stored in glycerin for two years more readily produced rabies in g. pigs and rabbits than the inoculation of infective rabbit brain. The ratio between the minimal cerebral infective dose and the minimal intravenous infective dose was considerably lower with the g. pig passage virus. After six passages the ratio of

infective rabbit brain was 1 : 25,000 for rabbits and : 6,500 for g. pigs ; that of g. pig brain was 1 : 50 to 1 : 500 for rabbits and 1 : 300 for g. pigs. This effect is not apparent when a recently isolated street virus is passaged through g. pigs.

The g. pig virus does not multiply at the site of intramuscular inoculation.
—E. C. HULSE.

JANEV, E. (1936). Problemata za bĕsa v čužbiana i u nas'. [**The Problem of Rabies abroad and in Bulgaria**].—*Vet. Sbir.* **40.** 114-122. [16 refs.]

J. discusses the incidence of rabies and the measures taken in the various countries of Europe against the disease. He states that the control measures in Bulgaria, where rabies is very prevalent, are quite insufficient. Owing to opposition to restrictions and the wooded character of many parts of the country which favours the growth of the dog population, control is difficult.

There is need for properly executed uniform measures over the whole country.

CAROBENE, S. (1936). Sulla virulenza del latte nella rabbia. [**Virulence of the Milk in Rabies**].—*Nuovo Ercol.* **41.** 298-302.

C. discusses whether infection can be conveyed in the milk of rabid animals and describes experiments that have been made, but speaks of the difficulty of excluding other sources of infection in his experiments. He infected a goat with rabies and gave the milk to rabbits and g. pigs, but only obtained results with rabbits he inoculated with extract of the goat's mammary gland or saliva. He concludes that the virus is not conveyed in the milk, but is present in the mammary gland.—S. F. J. HODGMAN.

LEVADITI, C., SCHOEN, R., & REINIÉ, L. (1937). Virus rabique des rues et papillome de Shope. [**Street Rabies Virus and Shope Papilloma**].—*C. R. Soc. Biol. Paris.* **124.** 793-794. [4 refs.] [See *V. B.* **7.** 600].

Street rabies virus may be transmitted by inoculation into the substance of a Shope papilloma on a rabbit. Subsequent passage of the tumour to g. pigs and rabbits does not transmit rabies.

The virus may be detected in the tumour after the intra-ocular inoculation of a rabbit with street rabies virus ; Negri bodies are not demonstrable in the tumour tissue.—E. C. HULSE.

DE MONBREUN, W. A. (1937). **The Histopathology of Natural and Experimental Canine Distemper.**—*Amer. J. Path.* **13.** 187-212. 20 figs. on 5 plates. [Numerous refs.]

A review of the symptomatology, aetiology and pathology of dog distemper is given and it is shown that the histopathology of the disease has received comparatively little attention. In the hope of obtaining a more complete understanding of this problem De M. gives the results of histological examination of various organs (especially the central nervous system) in 13 fatal cases of natural distemper in dogs, and in puppies infected artificially with distemper virus in the form of saline suspensions of liver from one of the natural cases. The latter comprised seven typical cases of the nervous form of distemper, five animals dying from the catarrhal form, and one 5½ weeks old puppy which died after an illness of only 30 hours, the symptoms being rapidly-developing weakness followed by coma. In the bronchial and alveolar epithelium of the lungs of all the cases, cytoplasmic and intranuclear inclusions were found. No such inclusions were found in the lungs of 18 normal dogs. Similar inclusions were found in the bile duct epithelium in all the animals, and were also present in the liver in both parenchyma and

Kupffer cells in the puppy that died within 30 hours. The reticulo-endothelial cells of the spleen and mesenteric lymph nodes contained intranuclear inclusions similar to those in the lungs and liver ; they were occasionally found in the intestinal epithelium. Occasional intranuclear inclusions were found in the glomerular tufts and in the adrenal medulla in the puppy previously mentioned. In the C.N.S. in different cases both cytoplasmic and intranuclear inclusions were found in mononuclear cells, neuroglia and microglia, capillary endothelium and nerve cells.

Puppies were experimentally infected by various routes with virus obtained from the puppy that died in 30 hours and from experimentally infected animals. Inclusions similar in every way to those recorded in the original natural case were found in every instance. Similar changes were found in experimentally infected ferrets.

Preliminary experiments showed that the distemper virus was capable of infecting the chorio-allantoic membrane of the chick embryo.

[Puppies receiving injections (intraperit.) of liver containing virus passed into coma 24-48 hours after injection and usually died during the third day. The short incubation period suggests that perhaps De M. was dealing with a virus which was not dog distemper virus, and that it was one which is more rapidly fatal].

—E. G. White.

Frohring, W. O. (1937). **Vitamins and Distemper. I. Introduction. II. Methods of Study and Preliminary Experiments. III. The Symptoms of Vitamin A Deficiency. IV. Vitamin B Deficiencies in Growing Puppies. V. Exposure and Inoculation of Puppies of Known Nutritional History.**—*Vet. Med.* 32. 9-11, 76-82, 190-195, 234-242 and 328-333. Numerous figs., 3 tables. [Numerous refs.]

I. F. reports the results of his investigations into the relationship between vitamin deficiency and distemper. He reviews the risks encountered in distemper immunization by the Laidlaw-Dunkin method.

II. The vitamin A content of the liver of a large series of puppies and adult dogs was measured and it was found there was a low reserve in puppies.

III. Feeding experiments were carried out with vitamin A-deficient food, and the effects of giving vitamin A at certain periods of growth were studied. The most constant symptoms of vitamin A deficiency were anorexia and emaciation ; these and the other symptoms observed were all cured by the addition of vitamin A to the diet.

IV. The effects of vitamin B deficiencies were studied : a series of puppies were fed on cows' milk rendered comparable to bitchs' milk to which vitamins A and D were added, the vitamin B complex being however deficient. All developed anorexia and emaciation. Yeast (a source of vitamin B) was now added to the diet, too late to save them as all but one died.

Another series of puppies were fed on the same diet but with the addition throughout of autoclaved yeast (containing factors in the vitamin B_2 complex, but no B_1), and a small quantity of dried yeast. When any loss of weight was noticed, the daily injection of crystalline vitamin B_1 immediately arrested the symptoms. The general effects of vitamin B_1 deficiency are discussed. The complex nature of vitamin B_2 deficiency in puppies is explained. Experiments are in progress and will be reported at a later date. There are at least three factors, namely, lactoflavin, vitamin B_6 and probably the pellagra-preventing factor ; a few examples are given to illustrate this point.

V. In order to study the relative susceptibility to distemper of puppies whose diet has received a vitamin supplement and those whose diet has not included an

excess of vitamins, a series of puppies believed to be susceptible to distemper and fed on the above diets, were exposed to distemper ; some were placed in a distemper ward and some were inoculated with a commercial distemper virus. It is suggested that the results indicate that the causal agent of distemper only produces pathological conditions in hosts whose resistance is lowered because of a poor nutritional state.—R. FISHER.

I. FINDLAY, G. M., MACKENZIE, R. D., & STERN, Ruby O. (1936). **Studies on Neurotropic Rift Valley Fever Virus : The Susceptibility of Sheep and Monkeys.**—*Brit. J. exp. Path.* **17.** 431-441. 3 tables, 5 charts. [10 refs.]

II. FINDLAY, G. M., & MACKENZIE, R. D. (1936). **Studies on Neurotropic Rift Valley Fever Virus : " Spontaneous " Encephalomyelitis in Mice.**—*Ibid.* 441-447. 4 tables. [7 refs.]

III. FINDLAY, G. J., STEFANOPOULO, G. M., & MACCALLUM, F. (1936). Présence d'anticorps contre la fièvre de la vallée du rift dans le sang des africains. [**Presence in the Blood of Africans of Antibodies against Rift Valley Fever**]. —*Bull. Soc. Path. exot.* **29.** 986-996. 2 tables. [Numerous refs.]

I. The authors describe the pathogenic action of neurotropic Rift Valley fever virus in sheep, lambs and monkeys. Repeated passage in mouse brains renders the virus increasingly neurotropic, not only for the mouse but also for the sheep and monkey. With the increase in neurotropism there was a decrease in pathogenicity when virus was administered subcut., and although sheep and lambs showed mild temperature reactions following subcut. inoculation of neurotropic virus they did not develop lesions of liver necrosis. Some degree of immunity against the pantropic strain resulted from the subcut. injection of neurotropic virus. Two species of monkey were found to be more susceptible to the neurotropic strain than to the pantropic strain of virus. Whereas recovery was the rule following intracerebral inoculation or intranasal instillation of pantropic virus, death invariably followed the administration of neurotropic virus by these routes.

II. Working with mice which possessed a high degree of visceral immunity to Rift Valley fever virus, two cases of spontaneous encephalitis were encountered. These developed after intraperit. inoculation of pantropic virus. The experiments carried out as a result of this led the authors to conclude that even when a high degree of immunity is possessed by the viscera either as a result of passively injected or actively produced immune bodies, the central nervous system may not possess the same degree of immunity and if virus reaches this relatively unimmunized tissue encephalitis may result. In such cases the presence of virus in the brain may or may not be demonstrable.

III. This is a review of the literature on Rift Valley fever and a report on the examination of a number of sera from natives of various colonies of Africa. The examination for antibody to Rift Valley fever virus showed that the disease is not confined to Kenya Colony alone although it does not appear to exist in the western colonies.—D. R. WILSON.

WALDMANN, O., & RADTKE, G. (1937). Erster Bericht über Erfolge der Bekämpfung der Ferkelgrippe durch die Riemser Einzelhüttenanlage. [**Control of Piglet Influenza with the Riems Single Hut System**].—*Berl. tierärztl. Wschr.* April 16th. 241-246. 14 figs.

As there is no effective drug or specific immunizing agent against piglet influenza, and as the " carrier " is such a prolific source of dissemination, the chain of infection can best be broken by maintaining piglets in the smallest possible units. Breeding sows are kept in a common open air run under good hygienic

conditions. A plank hut gives sufficient shelter. Fourteen days before they are due to farrow, they are put into individual runs, 1·5 metres distant from each other. They are fed at the end of the run farthest away from their hut so that in all weathers they must be in the open air at least twice daily. They remain there till the piglets can be weaned, after which they are removed, but the piglets remain there for another eight weeks. Two litters, at this stage, can be accommodated in one run. At four months old the piglets are transferred to fattening pens, but care must be taken that these have previously been cleared of all stock which has not been reared on the lines now recommended. These measures have eradicated the disease from individual premises. Those interested should consult the original for details and valuable sketch plans.—G. WILLIAMSON.

RIDALA, V. (1936). Porsaste influentsa (gripi) esinemisest Eestis. [**Swine Influenza in Estonia**]. *–Eesti loomarstl. Ring.* **12.** 209-218. [Numerous refs.] [English summary].

71 carcasses of young pigs, from two days to one year old were examined bacteriologically. *Haemophilus influenzae suis* was isolated from the lungs of six. On the farms from which these piglets were taken, it was observed that the 3-5 weeks old ones were coughing and in poor condition. When death occurred it was within one to four weeks after contracting the disease, but rarely later. In a chronic type of the disease, the clinical symptoms disappeared in two or three months, and the piglets overcame the delay in their development.

The autopsy of the above mentioned six piglets showed catarrhal pneumonia and a medullary swelling of the cervical, bronchial and mediastinal lymph nodes in each case ; in four piglets there was a moderate catarrhal gastritis and enteritis, a medullary swelling of all lymph nodes of the body, and slight swelling of the spleen. In two piglets there was found a marked serofibrinous peritonitis, pleurisy and pericarditis (a mixed infection). In two piglets there was a slight serofibrinous peritonitis and cirrhosis of the liver, and in one piglet there was a slight serofibrinous pericarditis.—ELFRIIDE RIDALA (TARTU).

HUPBAUER, A. (1937). Gripa prasadi, prvo ustanovljenje u Jugoslaviji. [**First Record of Swine Influenza in Yugoslavia**].—*Jugoslov. vet. Glasn.* **17.** 3-6. 1 table. [11 refs.] [German summary].

Swine influenza was first diagnosed by H. in Yugoslavia in September, 1934, and is believed to be wide-spread in that country.—B. OSWALD (SPLIT).

I. FAIRBROTHER, R. W., & HOYLE, L. (1937). **Observations on the Aetiology of Influenza.**—*J. Path. Bact.* **44.** 213-223. 5 tables. [16 refs.]

II. SMORODINTSEFF, A. A., & OSTROVSKAYA, S. M. (1937). **The Distribution of Influenza Virus in Experimentally Infected Mice.** *–J. Path. Bact.* **44.** 559-566. 5 tables. [4 refs.]

III. ANDREWES, C. H., & SMITH, W. (1937). **Influenza : Further Experiments on the Active Immunization of Mice.**—*Brit. J. exp. Path.* **18.** 43-55. 6 charts. [11 refs.]

I. Neutralization tests carried out with human sera show that the virus of human influenza and the swine virus, although similar, are by no means identical. Using as antigen desiccated lung tissue from infected mice, no distinction could be made between the two viruses by means of the complement-fixation test.

II. The Leningrad human influenza virus has been shown to be pneumotropic in mice. Its presence can, however, be detected in the blood, urine, spleen, liver and other organs of mice infected with material from the lungs of a mouse

inoculated with the tissue to be tested. The absence of pathological change in the lung of an infected mouse does not exclude the presence of virus in sufficient quantity to cause fatal infection in the mouse next inoculated with this material.

III. Either living influenza virus or virus inactivated by 1 : 5,000 formaldehyde, confers a substantial immunity on mice inoculated subcut. ; the immunity could be increased by a second inoculation 14 days later. A virus partially purified by washing on a collodion membrane was also effective, but a virus both washed and treated with formaldehyde was of little value.

A formolized virus, given subcut. to seven men in six cases markedly increased the titre of the antibodies in their sera.—H. H. HOLMAN.

I. MCBRYDE, C. N., & COLE, C. G. (1936). **Crystal-Violet Vaccine for the Prevention of Hog-Cholera ; Progress Report.**—*J. Amer. vet. med. Ass.* **89.** 652-663. 3 tables.

II. MUNCE, T. W. (1937). **Experiments with Crystal-Violet Hog Cholera Vaccine.**—*Ibid.* **90.** 304-321. 5 tables. [1 ref.]

III. BOYNTON, W. H., WOODS, Gladys M., & WOOD, F. W. (1937). **Progress in Hog Cholera Control with Tissue Vaccine.**—*Ibid.* 321-325. [6 refs.]

I. Sixty-three lots of swine fever vaccine were prepared from defibrinated blood of infected pigs, using crystal violet, either alone or with phenol, orthocresol, or disodium phosphate. The vaccine was administered to 271 pigs, which subsequently received an injection of virus in order to test their immunity. There was a slight reaction after vaccination in 9 % of the pigs, and it was found that 266 (98 %) were adequately protected. Immunity seemed to be established in 2 to 3 weeks, and lasted for about 6 months.

The vaccine showed no apparent deterioration after cold storage for 14 months, and a dose of 5 c.c. was adequate for pigs weighing from 40 to 90 lbs. The subcut. method of administration was found to be superior to intraperit. inoculation.

Although results obtained with crystal violet vaccine have been excellent, further work is necessary before its value can be fully determined, and farm experiments are being conducted.

II. M. reports the results obtained from the use of ten experimental lots of S.F. vaccine, prepared by mixing 90 parts of virulent defibrinated blood with 10 parts of 1 % aqueous solution of phenol and 5 parts of 1 % solution of extra pure crystal violet. The vaccine was kept for 14 days at a temperature of 37·5°C., after which susceptible pigs were inoculated from each " brew " for the purpose of determining whether a proper degree of attenuation had been obtained.

Immunity tests of the vaccinated pigs, by the administration of S.F. virus or by pen contact for 48 hours with affected pigs, were undertaken after the expiration of periods which varied from 21 to 201 days. Of a total of 118 pigs, 21 (17·7 %) died soon after vaccination, 17 (14·4 %) developed severe reactions, 5 (4·2 %) reacted slightly, and 75 (63·5 %) remained healthy. There was evidence to suggest that the immunity in existence 91-201 days after treatment was stronger than that which developed after a period of 21-42 days, and it also appeared that large doses of anti-S.F. serum interfered with the immunizing effect of the crystal violet vaccine. The immunity conferred by subcutaneous and intramuscular injections of the vaccine was approximately equal, and the experiments did not clearly indicate that 10 c.c. doses are superior to 5 c.c. doses.

III. The simultaneous method of immunization is probably the best for establishing resistance against S.F., but even so in dealing with an unmodified virus there is a definite risk.

It is claimed that tissue vaccines in which the virus has been rendered non-infective are less dangerous and more successful in combating virus diseases. S.F. tissue vaccines are prepared from blood and finely ground tissues of spleen, lymph nodes, kidney, testicle, spinal cord and red bone-marrow, mixed with an equal volume of a diluting fluid composed of three parts of physiological saline and one part of glycerin. Eucalyptol (1 %) is added, and after further preparation the mixture is bottled and stored. Each lot of vaccine is tested for efficiency on live pigs. Field immunization experiments are described, and to date 2,600 pigs have been vaccinated.

Pigs are inoculated when about 6 weeks old, two injections of 5 c.c. each being given at an interval of a fortnight.

A subsequent immunity test on 34 of these pigs showed a mortality of 9 %. It is stated that 6 lots of vaccine out of 9 have shown an efficiency of 100 %, and it is suggested that in routine pre-issue laboratory tests an efficiency of not less than 80 % should be required for field practice. It is claimed that the results obtained by this method, are most promising.—J. M. L. Penhale.

Debelić, Š. (1936). O prosudivanju mesa od virus-svinja rabljenih za dobivanje virusa svinjske kuge. [**The Virus Content of Tissues of Pigs affected with Swine Fever**].—*Jugoslov. vet. Glasn.* **16.** 367-372. 1 table. [Num. refs.]

The flesh derived from pigs used in the production of swine fever virus often shows degenerations and haemorrhages, and has a bad odour and taste. Such meat usually contains pathogenic organisms, *e.g. S. cholerae-suis*, and, owing to its high content of swine fever virus, plays an important role in spreading the disease. Neither the pathogenic organisms nor the swine fever virus are destroyed by procedures such as pickling, chilling or smoking.

Such pork, therefore, should be allowed for human consumption only if previously prepared by cooking or roasting, and, then, with special permission. —B. Oswald (Split).

Hupbauer, A. (1937). Zur Frage des Immunitätsdurchbruches nach Simultanimpfungen gegen Schweinepest. [**Loss of Immunity after Simultaneous Inoculation against Swine Fever**].—*Arch. wiss. prakt. Tierheilk.* **71.** 383-390. 6 tables. [9 refs.]

Generally it is taken for granted that simultaneous inoculation against swine fever gives a life-long immunity. Yet in 1935 in many herds in Yugoslavia it is stated that S.F. broke out again a few months after inoculation. This failure only appeared to occur on farms where the pigs lacked minerals or vitamins. H. carried out experiments on differently fed animals. He inoculated them (serum-virus) against S.F. and after periods varying from 2½ to 8 months inoculated them with virus. Those pigs which had been supplied with sufficient protein, Ca, P and vitamins before they were immunized resisted infection; likewise those which received these substances up to the time of infection. The pigs which were supplied with insufficient Ca, P and vitamins throughout the experiment, became affected. The quantity of protein in the food did not influence the result.

H. concluded that a solid immunity can only be attained when the animal is in full vigour at the time of inoculation.—G. Hartmann (Vienna).

Todoroff, A. (1936). La transmission de la peste porcine par l'intermédiaire des poux (Haemotopinus suis). [**Transmission of Swine Fever by Lice**].—*Rev. gén. Méd. vét.* **45.** 581-586. 2 tables, 2 charts.

Experiments were carried out with blood-sucking lice which had been removed from pigs affected with swine fever. Varying numbers were made into suspensions in saline and inoculated into four healthy pigs. Two pigs died on the 12th day from swine fever and a third recovered after having had a thermal reaction. In other experiments lice from infected pigs were placed on the backs of five healthy pigs. Two pigs died from swine fever, one on the 22nd day and one on the 30th day after infestation; one had a thermal reaction and survived, one survived, no temperatures having been taken, and the 5th remained normal. A small number of lice were also fed to one other pig but no definite result was obtained. T. concluded that lice found on the bodies of pigs affected with swine fever are carriers of infection.—D. R. WILSON.

FINDLAY, G. M., & MACKENZIE, R. D. (1937). **Fowl Pest: the Susceptibility of Monkeys, Hedgehogs and other Animals.**—*Brit. J. exp. Path.* **18.** 258-264. 4 tables. [12 refs.]

Fowl plague has been transmitted to the rhesus monkey, hedgehog, pigeon and duck. The monkey is susceptible to intracerebral inoculation of the virus. A febrile response is shown, and on P.M. examination the virus is found in the brain, liver and spleen, but not in the blood serum. Intranasal instillation of the virus produces an immunity. Hedgehogs are susceptible to the intracerebral inoculation of the virus. Ducks are insusceptible to intramuscular injection, but pronounced nervous symptoms ending in death follow intracerebral inoculation. Pigeons develop nervous lesions after intraperitoneal and intracerebral inoculation.
—E. C. HULSE.

CSERMELY, H. (1936). A tyúkleukosis bőrelváltozásairól. [**Skin Changes in Fowl Leucosis**].—*Állatorv. Lapok.* **59.** 279-280. 2 figs. [9 refs.]

In the cutaneous form of avian leucosis the skin becomes affected with a lymphoid infiltration, tumour-like masses being found without the formation of similar lesions in the internal organs, as might be expected.
—Z. DE CSUKÁS (MAGYARÓVÁR).

CORDIER, G., & MÉNAGER, J. (1937). Existence de *Rickettsia conjunctivae* du mouton Coles 1931, en Tunisie. [*R.c.* **in Sheep in Tunisia**].—*Bull. Soc. Path. exot.* **30.** 224-227. [1 ref.]

This preliminary note records *R.c.* in Tunisian sheep and compares the authors' observations with those already made in Algeria by DONATIEN and LESTOQUARD [*V. B.* **7.** 524]. Rickettsia were found in the large epithelial cells of various tissues, *e.g.* of the conjunctiva, etc.; these cells were sometimes entirely filled, others appeared to have been destroyed by the organisms. Watering of the eyes and reddening of the eyelids were observed in four of the infected subjects.
—C. HORTON-SMITH.

BRIGHAM, G. D. (1937). **Susceptibility of Animals to Endemic Typhus Fever.**—Summary copied *verbatim* from *Publ. Hlth Rep., Wash.* **52.** 660-662. [3 refs.]

The following animals trapped in Alabama were found to be susceptible to the virus of endemic typhus fever: Oldfield mice, cotton mice, golden mice, cotton rats, rice rats, wood rats, flying squirrels, and cats. Raccoons were not found susceptible.

CIUCA, M., BALTEANU, L., & CONSTANTINESCO, N. (1936). Contribution à l'étude épidémiologique du typhus. Réceptivité du chat au virus exanthématique. Infection spontanée inapparente. [**The Susceptibility of the Cat to Exanthematic Typhus**].—*Arch. roum. Path. exp. Microbiol.* **9.** 283-297. 14 figs. [4 refs.]

The authors show that cats are susceptible to an inapparent form of exanthematic typhus when fed on or inoculated (intraperit.) with typhus material from infected g. pigs. The disease was non-febrile, and the blood serum did not agglutinate *Proteus* X19 (Weil-Felix negative). Virus could be demonstrated in the brains of the cats up to 37 days after infection, by transmission to g. pigs (a febrile reaction followed by partial or complete immunity) and to white rats (an inapparent form with localization of the virus in the brain). The disease in cats was thought to be of limited duration by the authors because the brain of one cat fed on virulent g. pig material at the same time as another which developed the disease, failed to yield infective virus at the 69th day.

In addition the authors show that three cats in contact with human typhus cases contracted a spontaneous inapparent form of the disease [see also *V. B.* **5.** 815].—C. V. WATKINS.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

STEWART, W. L. (1936). **The Control of Sheep Ticks.**—*J. R. agric. Soc.* **97.** 81-95. 4 figs. on 2 plates, 1 table, 4 graphs.

Tests of a new anti-tick dip (arsenic-carbolic wool-grease compound – bath strength 0·17 % arsenious oxide) were carried out on 4 flocks of about 500 sheep each. In addition to destroying ticks, the dip was found to have some deterrent effect against re-infestation for the next 14 days, and its use is suggested for the control of tick infestation without interfering with the ordinary routine of sheep management. In-lamb ewes and lambs over 14 days old were, with certain precautions, dipped with safety.—E. E. JELBART.

GREGSON, J. D. (1936). **The Production of Artificial Conditions Conducive to Winter Feeding of Ticks (Dermacentor andersoni Stiles).**—*Proc. ent. Soc. B.C.* No. 32. pp. 6-7.

Adult *D.a.* ticks failed to engorge on rabbits and on man in Nov.-Dec., although ticks of the same stock had fed readily in summer. A rabbit was subjected to artificial light for increasing periods for one month, and three ticks afterwards placed on it engorged. One tick, which failed to attach to an untreated rabbit, was protected by a capsule from light and radiant heat, and the rabbit subjected to artificial light, whereupon the tick commenced feeding.—J. MACLEOD.

I. KOZINC, M. (1936). Prinosi ka početnomistraživanju "šintire" u Hercegovini zvanom " Ledjanicom ". [**Tick Paralysis in Sheep**].—*Jugoslov. vet. Glasn.* **16.** 252-254.

II. ZDANOVSKI, N. (1936). Valjavica ili žabica. [**Tick Paralysis**].—*Ibid.* 386-387. 2 figs.

I. In Bosnia (Yugoslavia) a disease of young ruminants, called " lajannitza ", occurs, similar to that recently described by MLINAC and OSWALD in South Serbia (Yugoslavia) under the name of " shimteera ", *viz* tick paralysis. Young animals mainly are affected, and the attack lasts about a week, ending in death or spontaneous recovery. The affected animals show the following symptoms :– depression, loss

of appetite, trembling, interruption of rumination, accelerated respiration and pulse, slightly abnormal temperature and falling. Such affected animals are found heavily infested with *Ixodes ricinus* and *Haemaphysalis sp.* After the fourth day the animals are usually slaughtered and consumed unless an early recovery is hoped for.

The sickness is often accompanied by nasal discharge, conjunctivitis and acute keratitis, sometimes leading to complete blindness. Relapses usually terminate fatally. Removal of ticks is often followed by an early recovery. Lesions are usually absent at autopsy, but a slight pulmonary oedema and a slight enlargement of the spleen may be observed.

II. Z. describes a disease of sheep occurring in some districts near the northern point of the Yugoslavian Adriatic coast. The disease is here called either " valyavitza " or " jabbitza ", and it seems to be identical with that described by MLINAC and OSWALD as tick paralysis. The illness starts with paralytic symptoms in the legs. There is no fever, the appetite falls off, and diarrhoea is often present. The disease appears in the early spring, *i.e.* along with the seasonal occurrence of ticks, and it stops as soon as the animals are removed from pastures infested with ticks and when shearing takes place.—B. O. (SPLIT).

NAČEV, B. (1936). Kliničeski izsledvanija v'rhu gastrofiliazata na konetě. [**Gastrophilus Infestation in the Horse**].—*Annu. Univ. Sofia.* **9.** 531-567. 10 figs., 4 tables. [16 refs.] [German summary].

Five species of *Gastrophilus* are found in Bulgaria, *G. equi* (*G. intestinalis*), *G. haemorrhoidalis*, *G. pecorum*, *G. nasalis* and *G. inermis*. *Gastrophilus* larvae were found by N. in 48 out of 72 aged horses killed for food in the Sofia zoological gardens. He also found them in most horses used in field work whilst carriage horses, town horses and army horses were usually free. He inoculated (intraven.) infested horses and asses with a filtrate of the ground larvae of *G. haemorrhoidalis*; they showed a slight anaphylactic reaction which lasted for one hour. In a second experiment N. inoculated four healthy horses and three old ones (subcut.) in a feverish condition, the latter showing pyrexia the origin of which is not discussed. The dose was 5 c.c. of a filtrate obtained by grinding 80 larvae of *G. equi*, 50 of *G. haemorrhoidalis*, 80 of *G. nasalis* and 50 of *G. inermis* in 80 c.c. saline; one of the old horses reacted severely 20 minutes after inoculation and died in a little more than 2 hours with typical symptoms of anaphylaxis. Specimens of *G. equi* and *G. nasalis* were found in its stomach.

DAVIES, W. M., & HOBSON, R. P. (1937). **Sheep Blowfly Investigations.**—*J. Minist. Agric.* **44.** 222-230. [12 refs.]

A review, in popular language, of recent advances in the investigation of the causes of blowfly attack of sheep in Britain. The development of the larvae of *Lucilia sericata* on living sheep is described, and it is pointed out that unless larvae are destroyed when a strike lesion is dressed the majority will succeed in completing their development to adult flies. The dual nature of the attraction of certain sheep for flies is described [*V. B.* **7.** 280]. The putrefactive factor may be supplied by " wool rot " – a matting of the fleece by crusts of hardened wool-grease. The incidence of this wool condition was found to be relatively high in Welsh sheep.

Preliminary investigations on control of myiasis indicated that none of the existing types of proprietary dips are efficient as repellents of the adult flies. Arsenical dips were found to remain toxic to larvae in the wool for 3-6 weeks, whereas carbolic, sulphur and vegetable powder dips did not last for more than 2 weeks.—J. MACLEOD.

TOWNSEND, C. H. T. (1936). **On** *Cochliomyia hominivorax* **Coquerel (Dipt.)**—*Rev. Ent., S. Paulo (Rio de J.).* **6.** 485-487. [In English]. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 50-51].

Attention is drawn to the discovery that the species of *Cochliomyia* generally responsible for cases of myiasis in man and animals is *C. hominivorax*, Coq. (*americana*, Cushing & Patton) and not *C. macellaria*, F. [*V. B.* **4.** 576, & **6.** 813, & *Ann. trop. Med. Parasit.* **28.** 315-322]. Characters are given distinguishing both sexes of the two species, and the significance of those defining the genus *Cochliomyia* are briefly discussed. The hypopygial terminology used by Patton [*V.B.* **4.** 576.] is criticised.

NYASALAND PROTECTORATE. (1936). **Annual Report of the Medical Entomologist for 1935.** [LAMBORN, W. A.]—*Annu. med. Rep. Nyasald. 1935.* pp. 50-52.

Experimental transmission of *Trypanosoma rhodesiense* to a dog was effected by flies feeding on a fresh scratch half an hour after their infecting meal.

—J. MACLEOD.

I. GOLD COAST. (1937). **Report on the Eradication of Tsetse-Fly of the G. palpalis Group from the Pong-Tamale Area, Northern Territories, Gold Coast.** [STEWART, J. L.] pp. 18. 4 tables. 1 map. [18 refs.] Accra : Govt. Printer. [fcp] [1s.]

II. GUIBERT. (1937). Les glossines du Cameroun. **[Glossina of the Cameroons]**.—*Bull. Soc. Path. exot.* **30.** 283-286. 1 fig., 1 table.

III. MELLANBY, K. (1937). **The Reproductive Cycle in** *Glossina morsitans* **and** *Glossina swynnertoni*.—*Parasitology.* **29.** 142. [2 refs.]

I. A campaign to eradicate tsetse fly from an area round the veterinary station at Pong-Tamale was carried out in 1931-1936. The principal fly was *Glossina tachinoides*. As the work progressed it was found that some of the beliefs on which the original programme was based, needed revision. The banks of the river were first cleared of bush for a stretch of several miles, by cutting and subsequently burning, and secondary streams, copses and such cover between the river and the station were then similarly treated. It was found that the chief danger of repopulation lay in these lesser foci, instead of in the main river, and in any subsequent schemes of a similar nature such cover would first be destroyed.

Observations on the bionomics of the flies are given. Contrary to common belief, the fly never evacuated the river area, even during intense flooding, but lived an aerial existence in the tops of the partially submerged trees. Puparia were found in cracks in the trees above flood level. During the dry season flies occasionally made brief excursions from cover for distances of up to 800 yards

II. G. gives a brief preliminary account of a survey of the species of glossina in the Cameroons. Details of the distribution, movement routes and density of the flies in this area are shown in a map, which is a reduced copy of one made when carrying out the experiment.

III. M. compares the reproductive cycles in *G. morsitans* and *G. swynnertoni* with that of *G. palpalis* [see *V. B.* **7.** 333]. Laboratory studies showed that the type and rate of ovarian development was almost identical in the three species, and it is concluded that the three have, therefore, a similar reproductive cycle.

—J. MACLEOD.

VAN HOOF, L., HENRARD, C., & PEEL, E. (1937). La piqûre de la glossine infectieuse. **[Transmission of Infections by Glossina]**.—*Ann. Soc. belge Méd. trop.* **17.** 59-62. [2 refs.]

By use of a special apparatus, individual flies were fed on known quantities of blood through animal membranes, and the number of trypanosomes left in the residual blood was estimated. It was found that *Glossina palpalis*, infected with *Trypanosoma gambiense*, inoculated very few organisms into the blood, although the salivary glands and ducts were packed with them.

Since the bite of an infected fly was usually found to result in infection of an experimental animal, the authors suggest that the great majority of trypanosomes are deposited, not in the blood but in the skin, during the act of piercing, before the upflow of blood arrests the outflow of infected saliva.—J. MacLeod.

Pullar, E. M. (1937). **Melophagus ovinus (Linnaeus, 1758) Infesting a Calf. With a Note on the Body Length of the Parasite.**—*Aust. vet. J.* **13.** 72-74. 1 table. [3 refs.]

A calf became infested with *M. ovinus* through contact with infested sheep. The parasite developed normally upon the unusual host and measurements agreed with those of keds from sheep. P. points out that the body length of *M.o.* is usually given as 4 to 6 mm., whereas specimens measured by him ranged from 4 to 7·1 mm.—H. McL. Gordon.

Werneck, F. L. (1936). Contribuição ao conhecimento dos Mallaphagos encontrados nos mammiferos sul-americanos. [**Mallophaga of South American Mammals**].—*Mem. Inst. Osw. Cruz.* **31.** 391-589. 226 text figs., 1 fig. on 1 plate. [Numerous refs.]

This is an incomplete description of mallophaga of the South American mammals which W. hopes to complete. Most of those named are parasitic on rodents. Of veterinary interest are *Trichodectes canis* of the dog, *T. subrostratus* of the cat, *T. ovis* of the sheep, *T. caprae* and *T. limbatus* of the goat, *T. bovis* of the ox and *T. equi* of the horse.—S. Torres.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

I. Babić, I., & Wertheim, P. (1936). Istraživanja metiljavosti I. *Galba truncatula* Müller. [**Liver Fluke Infestation in Yugoslavia. I.** *G.t.* **Müller**].—*Jugoslov. vet. Glasn.* **16.** 469-473. 1 fig. [14 refs.]

II. Babić, I. (1936). Istraživanje metiljavosti II. [**Liver Fluke Infestation in Yugoslavia. II**].—*Ibid.* 618-629. 4 tables. [7 refs.]

III. Wertheim, P. (1937). Istraživanje metiljavosti III. Galba truncatula Müller u porječju rijeke Krapine i njeno suzbijanje. [**Liver Fluke Infestation in Yugoslavia. III. Distribution of** *Galba truncatula*].—*Ibid.* **17.** 100-112. 1 map. [12 refs.]

I. In Yugoslavia liver fluke is very common causing heavy losses. The authors state that it is not sufficient to cure infested animals, but that a systematic eradication campaign of the intermediate host is also necessary. For this purpose a systematic investigation of *Galba truncatula* in Yugoslavia was arranged; this species appears to be the only one involved in transmission of liver fluke in Yugoslavia. It was found that there was a high incidence of infestation by developing stages of liver fluke in this snail.

II. The distribution of the liver fluke for the past ten years' period in the Sava Province, Yugoslavia, was considered and factors governing its distribution were discussed. The original must be consulted for details.

III. The distribution of *G.t.* in a certain territory near Zagreb, Yugoslavia, was studied. The article is not suitable for abstraction.—B. Oswald (Split).

PENFOLD, H. B. (1937). **The Life History of Cysticercus bovis in the Tissues of the Ox.**—*Med. J. Aust.* April 17th. 579-583. 4 tables. [3 refs.]

Thirty cattle were experimentally infected with *C. bovis* and the life-cycle in tissues was studied during a period of two years. Under the conditions of the experiment it was shown that no cysticerci lived longer than nine months, and the majority were dead before they were four months old. The length of life of cysts varied greatly in the same or different animals. The age of cysticerci over six to eight weeks cannot usually be accurately estimated. Degenerated cysts gradually decreased in size with age until they were completely absorbed or in some cases left minute fibrous scars. Absorption of all cysticerci was complete in two of three animals examined two years after they had been fed a massive dose of eggs. In the third animal almost all the cysts had been completely absorbed.

The macroscopic appearances of the contents of measles during their development and degeneration are described and illustrated.—H. McL. GORDON.

BEARUP, A. J. (1937). **A Search for Trichinella spiralis in Cadavers in Australia.** —*Med. J. Aust.* April 3rd. 504-505. 1 table. [7 refs.]

Microscopic examinations of 119 human cadavers in Australia for *T. spiralis* resulted in three positive cases being discovered. In each case the progress of calcification and the microscopic appearance of the larvae indicated that the infections were not recent and it is thought that they were probably acquired outside Australia. B. states that no case of *T. spiralis* in man or animals has yet been shown to have originated in Australia.—H. McL. GORDON.

IMMUNITY.

TRETTIN, H. (1936). Vergleichende Versuche über die Intrakutanimpfung beim Rinde mit verschiedenen Tuberkulinen. [**Intradermal Tuberculin Tests on Cattle**].—*Inaug. Diss., Leipzig.* pp. 46. 4 tables. [Numerous refs.]

The value of three different tuberculin preparations was compared with a standard tuberculin (Hoechster) by means of intradermal tests on 2,679 cattle. A Danish preparation yielded 62% of positive reactions when the standard yielded 69%. A closer agreement was obtained between Perleberger tuberculin and the standard – 57% against 59%. Finzi tuberculin failed to reveal reactors in a large percentage of cases. A useful review of the literature dealing with the tuberculin test is given.—S. J. EDWARDS.

PINKEPANK, H. (1936). Ueber allergische Tuberkuloseuntersuchungen beim Rinde. [**Tuberculin in Tests on Cattle**].—*Inaug. Diss., Hanover.* pp. 58. [Numerous refs.]

The value of the intrapalpebral and intradermal tests for the diagnosis of tuberculosis was compared in 1,384 cattle. The results showed that 571 (41·25%) reacted to the former and 325 (23·48%) to the latter. Of 380 cattle which gave doubtful reactions to the intradermal test 211 were positive to the intrapalpebral test. P.M. verification of the results was conducted on the 211 animals and it was found that the intrapalpebral test gave closer agreement. P. gives details of the procedure for these two tests; for the intrapalpebral 1 c.c. of concentrated tuberculin was injected into the lower eyelid and the temperature of the animal was recorded two hours before injection and 6 hours and 18 hours after injection. The local reaction was judged by the degree of oedema and conjunctivitis produced.

—S. J. EDWARDS.

SVANBERG, V. (1934). Tuberkuliinilla suoritettuja vastavaikutuskokeita sikojen tuberkuloosissa. [**Research on Tuberculin Testing**].—*Suom. Eläin-lääkäril.* **40.** 171-181, 204-213 and 223-233. 7 figs., 22 tables. [10 refs.] [German summary].

S. examined the possibility of applying the tuberculin test to the ear of pigs. 0·1 c.c. tuberculin was inoculated intradermally into the right ear and the same amount of control broth in the left. The test was carried out on three groups of pigs about two and a half months after artificial infection with bovine, human and avian types of tuberculosis respectively. All infected pigs gave typical reactions (a reddish-blue coloured spot at the site of the injection). The total thickness of the ear was measured immediately before and 48 hours after the application of the test.

275 pigs from different swine farms were also tested. In all cases of fresh infection the results were positive, but in chronic encapsulated forms of TB, there were no reactions.

Where many pigs were together the test was sometimes affected by bruising of the ears from contact with each other.—P. I. STENIUS (HELSINGFORS).

OKLJEŠA, B., & TOMAŠEC, I. (1937). O konjunktivalnoj alergičnoj reakciji kod Bangove infekcije goveda po van der Hoedenu. [**van der Hoeden's Conjunctival Test for Brucellosis**].—*Vet. Arhiv.* **7.** 317-328. 1 fig., 3 tables. [5 refs.] [German summary].

The results obtained by van der Hoeden's conjunctival test for brucellosis were compared on 228 cattle with those obtained by the aggl. test. 26 animals gave positive reactions and 14 gave doubtful reactions to the aggl. test, while 39 reacted positively and 7 doubtfully to the conjunctival test.

One cow was infected by a live culture of *Br. abortus* and another was inoculated with a dead culture. The former reacted positively to the conjunctival test only, while both reacted positively to the aggl. test.

The authors commend the conjunctival test, though it has three disadvantages:– (1) the possibility of a change of the conjunctival reaction following repeated testing at short intervals, (2) a comparatively high incidence of agglutination-positive animals give a negative conjunctival test, and (3) quick disappearance of the conjunctival reaction, so that two-hourly observations from 12 or 24 hours are suggested.—B. OSWALD (SPLIT).

KELLER, Alvin E., PHARRIS, C., & GAUB, W. H. (1936). **Diagnosis of Undulant Fever. The Opsonocytophagic, Allergic and Agglutination Reactions.**—*J. Amer. med. Ass.* **107.** 1369-1373. 1 fig., 5 tables. [2 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 124-125. Signed G. S. WILSON].

Though the agglutination test is probably the most valuable single method for the diagnosis of undulant fever, it is clear that it cannot be relied upon entirely – particularly in mild infections, chronic infections, and infections in children. For this reason the authors made a study of the allergic skin reaction and of the opsonocytophagic test described by HUDDLESON and his colleagues. The skin test was made by the intradermal inoculation of 0·1 c.c. of a 1/1000 dilution of a soluble nucleoprotein fraction extracted from Brucella, and readings were taken after 48 hours, so as to allow the occasional non-specific erythematous reactions to subside. The opsonocytophagic test (Ocp.) was carried out in accordance with the original instructions [*Amer. J. publ. Hlth.* **23.** 917]. Three groups of persons were examined :– (1) Group I consisted of four patients who were suffering or who had just recovered from undulant fever ; (2) Group II consisted of 576

persons who were not ill, but who were living under conditions favourable for infection with Brucella ; (3) Group III consisted of 44 patients – mainly febrile – diagnosed as suffering from diseases other than undulant fever. The detailed results cannot be given here, particularly as the notation of the opsonocytophagic test is rather complex. The general results, however, showed that in Group I the skin test was positive, the ocp. activity was usually high, while agglutinins had either disappeared or were present only in low titre.

In Group II 29 of the 576 persons gave a positive skin reaction. Of these, 3 had agglutinin titres varying from 1/20 to 1/160 ; 10 showed marked, 12 showed moderate, and 7 showed little or no ocp. activity. In Group III all three tests were negative in 41 of the 44 patients. The 3 remaining patients had agglutinin titres of 1/20 to 1/80. Of these, one had also a positive skin test and a high degree of ocp. activity. This patient was probably a case of undulant fever. In the remaining two patients the skin and ocp. tests were both negative. The authors agree with HUDDLESON's conclusion that a positive skin test indicates a state of allergy resulting from Brucella infection ; that a negative skin test with little or no ocp. activity indicates susceptibility to infection ; that a positive skin test with a low ocp. activity indicates that the patient is actively infected ; and that a positive skin test with a high ocp. activity indicates that the patient is immune – the immunity resulting from a previous latent or active infection. The agglutination test is most frequently positive during the febrile stage of the disease and for a variable time after the temperature has fallen. It is thought, however, that the diagnosis of undulant fever in the absence of agglutinins can be made on the combination of the skin and opsonocytophagic tests.

SACHWEH, P. (1937). Zur Frage der Flockungsreaktionen. Bemerkungen zu dem Artikel Dr. Stockmayer's " Ueber die Serodiagnose der Bruzellose ". [**Flocculation Reactions**].—*Dtsch. tierärztl. Wschr.* **45.** 247-248. [4 refs.]

STOCKMAYER [*V. B.* **7.** 267.] expressed the opinion that the agglutination test offered the best method available for the serological diagnosis of brucella infection. Sachweh opposes this view and contends that the " Meinicke-Klarung " reaction is superior to the agglutination test. No fresh data are recorded.
—E. J. PULLINGER.

SHRIGLEY, E. W., & IRWIN, M. R. (1937). **On the Differences in Activity of Serum Complement from Various Animal Species.**—*J. Immunol.* **32.** 281-290. 3 tables. [16 refs.]

The normal sera of oxen, rabbits and sheep were found to be highly bactericidal for *Brucella abortus*, porcine strain, but normal g. pig serum was inactive. The bactericidins were inactivated by heat or by absorption with killed suspensions of *Br.a.* Sheep and ox complements were the best activators of bactericidins against this organism.

Rabbit complement was not so active, and g. pig complement failed to activate any sera against *Br.a.* The order of activation is completely reversed when these animal sera are used in a haemolytic system.

It is, therefore, obvious that animal sera when used to supply complement are not interchangeable.—D. L. HUGHES.

ANGELOFF, St., & KUÜMDJIEFF, I. (1936). **The Production of Precipitating Anthrax Serum.**—*Annu. Univ. Sofia.* **9.** pp. 135-144. [14 refs.] [In Bulgarian : German summary].

Surface cultures of a very virulent anthrax strain were washed off with formol-saline after 24 hours and the suspension was incubated in vessels with paraffined corks for 48 hours at 37°C. The whole was injected intraven. into an immune horse. Ten days later a subcut. desensitizing injection of 1 c.c. of a similar inoculum was given, followed by a second intravenous injection. Eleven days later a third intravenous injection, this time of live bacilli from a virulent strain was given – this also being preceded by a similar subcut. desensitizing injection. Blood-serum taken eight days after the last injection yielded a precipitin. Three days later another injection of live culture was given. The serum from the blood sample taken on the eighth day after this last injection was very rich in precipitin.

GORDON, J., & WOOD, N. (1937). **Reversible Neutralization by Congo Red of the Anthracidal Power of Serum.**—*J. Hyg., Camb.* **37.** 471-473. 1 table. [3 refs.]

Addition of congo red to rabbit serum was found to inactivate the anthracidal action of the latter. The reversibility of this inhibitory effect of congo red, *i.e.* restoration of anthracidal power, can be demonstrated by adding to the congo red-serum mixture an appropriate amount of rabbit serum previously deprived of its anthracidal power by treatment with charcoal, provided that the original quantity of dye used is not too large.—N. J. SCORGIE.

KRITSCHEWSKI, I. L. (1937). Les nouvelles voies dans les recherches sur l'immunité. [**New Methods of Immunity Research**].—*Rev. Immunol.* **3.** 265-282. 13 figs. [7 refs.]

Using Dale's technique for observing the contractions of g. pigs' uteri suspended in Ringer's solution, when subjected to the action of various stimulants, K. has studied cellular immunity. It was found that the uteri of g. pigs immunized to *Brucella abortus* failed to contract on stimulation with the endotoxin of the same organism, although uteri from non-immune g. pigs contracted under similar stimulation. That this was not due to the intervention of humoral antibodies was shown by the fact that the uteri were freed from all body fluids, and that contraction occurred in the normal uterus on the addition of endotoxin and its homologous antiserum. The immunity of the uterine cells was found to be specific for each species of organism.

These experiments were also performed with *Salmonella typhi*, cultures of *Corynebact. diphtheriae*, its toxin and anatoxin, and the reaction of uteri sensitized to sheep serum when stimulated with the endotoxin of *Br.a.* was also studied.

For the application of these ideas to immunity in general and to brucellosis in the cow, the original paper should be consulted.—D. L. HUGHES.

I. NASTA, M. (1935). Recherches sur le mécanisme de l'immunité dans la tuberculose. (Deuxième mémoire). (Influence de la réaction inflammatoire immédiate sur l'évolution de la lesion de réinfection cutanée). [**The Mechanism of Immunity to Tuberculosis. II**].—*Arch. roum. Path. exp. Microbiol.* **8.** 317-324. [6 refs.]

II. NASTA, M., & CRACIUM, E. (1935). Recherches sur le mécanisme de l'immunite dans la tuberculose. (Troisième mémoire). (Etude histologique de la lésion de réinfection intradermique chez le cobaye). [**The Mechanism of Immunity to Tuberculosis. III**].—*Ibid.* 325-346. 7 figs. [13 refs.]

I. In a previous publication N. reported that reinfection of sensitized g. pigs with tubercle bacilli is accompanied within 24 hours by an inflammatory reaction of varying intensity at the site of reinjection. This is followed during the next

8 or 10 days by the formation of a nodule; the present experiments show that the immediate reaction and nodule formation are apparently conditioned by two different sets of factors. No correlation was observed between the intensity of the immediate inflammatory reaction and the tendency towards regression of the lesions at the reinfection site, and consequently N. concludes that this inflammatory reaction plays little part in the specific mechanism by which the host's tissues resist reinfection.

II. The histology of the lesions at the site of reinfection is described. The reaction is characterized by two different series of inflammatory phenomena. The first is acute, accompanied by oedema, hyperaemia, polymorphonuclear leucocytosis, early and rapid necrosis, changes which become more marked as the state of allergy increases. It is pointed out that this reaction is typical of that which follows reinjection of any foreign protein into a sensitized animal. The second series is of a more specific kind, characterized by early abscess formation, by accelerated cellular response with mobilization of giant cells, fibrocytes and histiocytes, and by the presence of collagen. The greater the state of allergy, the less marked are these changes. The authors discuss the significance of their findings, and conclude that the severity of the inflammatory response is not an indication of the degree of immunity.—N. J. Scorgie.

Minett, F. C. (1937). **Staphylococcus Antitoxin in the Blood and Milk of Cows and other Animals.**—*J. comp. Path.* **50.** 173-190. 15 figs., 8 tables. [Numerous refs.]

In cattle of both sexes and in goats there is a direct relationship between the age of the animal and the staphylococcus antitoxin titre of its blood.

Evidence is produced to show that the occurrence of antitoxin in cows' blood is due in part to udder infection with *Staph. aureus.* Points in the evidence are as follows:– the incidence of udder infection with this organism increases with age; by infusing into the normal udder some *Staph.a.* culture a rise of blood antitoxin is produced; among cows there is a fair measure of correlation between udder infection with *Staph.a.* and the presence of circulating antitoxin; the antitoxin titre of the blood sometimes rises sharply after calving, presumably owing to renewed growth of staphylococci in the udder.

In cows and sheep, injections of staphylococcus toxoid cause a rise in circulating antitoxin and in some cases increase of antitoxin in the milk. In the milk of normal udder quarters the amount of antitoxin is usually 1:80 to 1:40 of that in the blood serum, but in colostrum the amount may equal or exceed that present in the blood. When the quarter is inflamed through any cause, *e.g.* from streptococcus infection, the amount of antitoxin in the whey increases owing to its higher blood serum content. Parallel with this, the whey from such inflamed quarters is likely to show a higher titre of *Brucella abortus* agglutinins in cases where the animal is infected with this organism.

Staphylococcus toxin can be demonstrated in the udder secretion of acute cases of staphylococcus mastitis.

Facts brought forward in this paper have a bearing on the general question of the source of " natural " antitoxin in blood and of antibodies in milk.

Kitching, J. S., & Farrell, L. N. (1936). **Staphylococcal Immunity.**—*Amer. J. Hyg.* **24.** 268-284. 7 tables. [17 refs.]

K. and F. compared the effectiveness of formolized staphylococcus vaccine and of staphylococcus toxoid as antigens for actively immunizing rabbits and mice against parenterally injected living staphylococci and their filtrates, and against the

dermo-necrotic effect of staphylotoxin in rabbits. The effect of toxoid injections was found to correspond approximately to the amount of circulating antitoxin, the titre of which fell sharply about 10 days after the last injection to about half and then gradually declined. Its maximum titre could be almost regained by one more injection of toxoid.

The vaccine used, which produced neither antitoxin nor increased resistance to the test substances, was freed from exotoxic products by growing the staphylococci on agar and then washing them with formolized broth. Rabbit erythrocytes were used for all determinations of the titre of antitoxin in sera, this assay being found a satisfactory measurement of staphylolysin and being in direct proportion to the *in vivo* toxicity of the bacteria and their filtrates.—C. V. WATKINS.

TEJLER, T. (1937). **Some Experiments on the Bactericidal Effect of Normal Serum on Staphylococcus pyogenes aureus.**—*Acta path. microbiol. scand.* **14.** 1-14. 6 tables. [Numerous refs.] [In English].

Previous workers have claimed to be able to classify staphylococci according to their sensitivity to complement or β lysin in sera. T. tested human, sheep and rabbit sera, either untreated or inactivated at 56°C. or 68°C. after dilution with an equal amount of saline solution, against cultures of 7 human strains of staphylococci and a typical *Bacterium coli*. In no case could bactericidal action for staphylococci be determined for any human or sheep sera so tested, although these tests were positive for *Bact.c.* The author suggests that strains of staphylococci may vary in their properties when mixed with sera, and that this might account for his negative results and the previously recorded divergent findings of other workers.—C. V. WATKINS.

CLUTTON, R. F., HARINGTON, C. R., & MEAD, T. H. (1937). **Studies in Synthetic Immunochemistry. I. The Synthesis of O-β-Glucosidotyrosine and its Introduction into the Protein Molecule.**—*Bio-chem. J.* **31.** 764-771. 1 fig. [5 refs.]

In the study of artificial carbohydrate-protein compounds it has been shown that simple carbohydrate groups, such as hexosido residues are capable of inducing considerable immunological specificity. The value of the deductions is lessened, however, by the fact that the carbohydrate groups are attached to the proteins through a linkage which does not occur in nature.

The authors, therefore, aimed at preparing an artificial protein-carbohydrate compound in which the components were combined in the same way as in naturally occurring proteins which contain carbohydrate groups. As a result of experiment, details of which are given, O-β-glucosidotyrosine was synthesized and the glucosidotyrosyl residue was then introduced into a protein, gelatin. The properties of the O-β glucosidotyrosylgelatin are described, and evidence is presented that in it the glucosidotyrosine residues are attached to the α-amino-groups of the original gelatine.—H. V. HUGHES.

MARSHALL, M. S., & HRENOFF, A. K. (1937). **Bacteriostasis.**—*J. infect. Dis.* **61.** 43-54. 3 figs. 4 tables. [11 refs.]

This paper is mainly a theoretical consideration of the limitations of the present methods used for evaluating the actions of disinfectants. It is pointed out that co-efficient methods under one set of standardized conditions give " a fictitious appearance of accuracy ", and do not provide a complete evaluation for varying sets of conditions. The authors develop the concept of a " disinfectant spectrum " in which varying concentrations of disinfectants are shown to shift their activities

from rapid germicidal action to barely perceptible inhibition. They have determined the bacteriostatic ranges of 20 disinfectants acting upon six organisms but they emphasize that their results are in no sense a complete evaluation of these disinfectants.—N. J. SCORGIE.

I. THEILER, M., & SMITH, H. H. (1937). **The Use of Yellow Fever Virus Modified by in vitro Cultivation for Human Immunization.**—*J. exp. Med.* **65.** 787-800. 7 tables. [13 refs.]

II. FINDLAY, G. M., & MACCALLUM, F. O. (1937). **An Interference Phenomenon in Relation to Yellow Fever and other Viruses.**—*J. Path. Bact.* **44.** 405-424. 13 tables. [Numerous refs.]

I. Vaccine was prepared by the prolonged cultivation of the yellow fever virus in a medium with chick embryo containing minimal amounts of nervous tissue. Monkeys inoculated subcut. with the vaccine were rendered immune to a subsequent injection of virulent virus, while antibody was demonstrated in the blood of eight normal persons vaccinated.

II. Inoculation experiments show that the neurotropic yellow fever virus protects against the pantropic, but that the latter does not protect against the neurotropic. This phenomenon is not due to the sudden appearance of immune bodies. Mice inoculated with a mixture of neurotropic yellow fever virus and pantropic Rift Valley fever virus may be completely protected, but in any case, death is delayed. No protection is given when the yellow fever virus is injected 24 hours after the Rift Valley fever virus, nor if normal brain is used to replace the neurotropic virus. The interference may be explained if certain cells when occupied by active virus cannot be invaded by other virus particles. A possible relationship between the viruses of yellow fever and Rift Valley fever is discussed, also a somewhat similar phenomenon to the above occurring among certain plant viruses.—A. WILSON TAYLOR.

DISEASES, GENERAL.

PANISSET, L. (1937). Les conditions de l'apparition, du développement et de l'extension des maladies infectieuses des animaux. [**Epidemiology of Infectious Diseases of Animals**].—*Rec. Méd. vét.* **113.** 193-214. 10 figs. [Numerous refs.]

A general review of epidemiology. P. gives the proper methods to use in the study of epidemics and discusses the variations in severity which are noted between epidemics due to the same disease but occurring in different years, and mentions the effects of secondary infections. He deals with various factors which influence the susceptibility or resistance of the animals concerned in the outbreak.—P. S. W.

GENEROSO, J. D. (1937). **Symposium on the Most Common Dangerous Equine Diseases in the Philippines.**—*Philipp. J. anim. Indust.* **4.** 117-125.

These comprise surra, glanders, epizootic-lymphangitis, strangles, tetanus, anthrax and influenza. Surra is said to cause more deaths than all the others together. G. states that naganol used alone is not very effective in the treatment of surra, but he gives no details. A severe diarrhoea of horses is mentioned. Its cause is unknown but it is easily cured by 15-30 c.c. saturated solution of camphor in oil of turpentine given orally.—E. E. JELBART.

GREAT BRITAIN. (1936). **Ministry of Agriculture and Fisheries. Control of Poultry Diseases. Memorandum describing Action of Ministry under the Diseases of Animals Act, 1935.** pp. 8. London: H.M. Stat. Off. [8vo].

The new Orders issued in 1936, namely The Fowl Pest Order, The Poultry and Hatching Eggs (Importation) Order and The Poultry Markets and Receptacles (Disinfection) Order are summarized. In addition the factors prompting the decision not to introduce compulsory measures for dealing with the prevalent poultry diseases in this country are given. Poultry owners will be advised by means of leaflets, through educational institutions and where necessary by Veterinary Inspectors of the Ministry.—J. C. WALLACE.

CORDIER, G. (1937). Les principales maladies des volailles observées en Tunisie. [**Poultry Diseases of Tunisia**]. pp. 90. 17 figs., 1 table. [12 refs.] Tunis: Service de l'Elevage. [8vo].

A popular booklet written for the use of poultry keepers in Tunisia. The common internal and external diseases of poultry are first dealt with in tabular form to help the reader to form a tentative diagnosis, then each disease is described *seriatim* and instructions about treatment given.—J. E.

KARLSON, J. (1936). Juurdlusi latentsete udarainfektsioonide levikust lüpsilehmadel ja nende toimest piimatoodangusse. [**Latent Mastitis and Milk Production**].—*Eesti loomaarstl. Ring.* **12.** 1-25. 5 tables. [14 refs.] [German summary].

Clinical examinations of the udders and bacteriological investigations of the milk samples were carried out in a herd of 83 cows by means of g. pig inoculations and cultural methods. The data are summarized in a table.

The udders of 23 cows (27·7 %) in this herd were infected with *Brucella abortus*; 45 cows (54·21 %) had a *Streptococcus agalactiae* infection, and two of these were also infected with micrococci; the udders of 10 cows (12·05 %) were infected with micrococci only. Tubercle bacilli were not to be found in any of these 83 cases.

The physical examination of the udders revealed changes in 16 (55·17 %) out of 29 udders affected with streptococci only; in 4 (33·33 %) of 12 udders infected with *Br.a.* and *Str.a.* changes were found, and in 2 out of 7 udders infected with *Br.a.* (28·37 %). In 3 udders (15·79 %) out of 19 with negative bacteriological findings changes were found.

In comparison with the yield in cows in which the udders were healthy, bacteriologically and clinically, the diminution in the yield was 36 % when the udders were infected with *Br.a.*, 12 % when infected with *Str.a.* and 21 % when infected simultaneously with *Br.a.* and *Str.a.*—ELFRIIDE RIDALA (TARTU).

I. SARNOWIEC, W. (1936). Evolution expérimentale des infections tuberculeuse et brucellique, associées, chez le cobaye. [**Development of Experimental Associated Infections with Brucella and Tuberculosis in Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **123.** 452-454. [3 refs.]

II. SARNOWIEC, W. (1937). Etudes sur la dissociation *in vivo* des *Brucella* par inoculation aux animaux tuberculeux. [**Dissociation *in vivo* of Brucella by Inoculation into Tuberculous Animals**].—*Ann. Inst. Pasteur.* **58.** 418-445. 6 figs., 5 tables. [Numerous refs.]

I. Tuberculous g. pigs at different stages of infection were inoculated with a young living culture of *Br. abortus*. No obvious modification of the course of the TB. infection was produced. Other g. pigs were infected with *Br.a.* and 1 or

2 months later with tubercle bacilli ; again the course of the TB. infection was not altered. The strain of *Br.a.* used was apparently not fully virulent and the infection may have been overcome in the second experiment before the tubercle bacilli were injected.

II. Tuberculous g. pigs were inoculated with a young living smooth culture of *Br. abortus*. A g. pig was killed on each of fifteen days after inoculation and cultures made on agar and in broth from different organs. Typical rough (R) forms were obtained as well as smooth (S), but the latter were greatly increased in virulence, producing abscessation and death when re-inoculated into g. pigs. This dissociation was not obtained in g. pigs inoculated first with BCG or with dead tubercle bacilli, nor in broth cultures of the tubercle bacillus.—A. WILSON TAYLOR.

WIIDIK, R. (1937). Ueber das Vorkommen von Fleischvergiftern und Abortus-Bang-Bakterien in Fällen von weisser Fleckniere des Kalbes. [**Meat Poisoning Organisms and** *Br. abortus* **in Calves with Spotted Kidneys**].—*Wien. tierärztl. Mschr.* **24.** 353-365. [Numerous refs.]

In Vienna abattoirs 90 cases of spotted kidney in calves from three to six weeks old were found between February and July, 1936 (about 1 % of all slaughtered calves). The kidneys, livers and spleens with their regional lymph nodes, and in 12 cases also the mesenteric lymph nodes, were bacteriologically examined for meat poisoning organisms and for *Br. abortus*. In no cases were meat poisoning organisms or *Br. abortus* found. Serological tests for *Br. abortus* were also negative. *Bact. coli* believed to be contaminants after slaughter were found in 32·2 % of kidneys and in 30 % of the renal lymph nodes, also frequently in the other organs examined. W. is of the opinion that spotted kidneys are not due to a bacterial infection of the kidneys but that they are of toxic origin.—G. HARTMANN (VIENNA).

GRIEDER, H. (1937). Der gegenwärtige Stand der Pelztierzucht in der Schweiz. [**Fur Animal Breeding and Diseases in Switzerland**].—*Dtsch. Pelztierz.* **12.** 186-190. 7 figs.

Breeding of the silver fox is now a well established and profitable industry. On a lesser scale, racoon breeding has also been successful. Mink breeding is rather difficult. Serious financial loss has been experienced in attempts to raise nutria, as they have been decimated by entozoa, chiefly a blood sucking trichostrongylus and a tapeworm (*Hymenolepis octocoronata*), as well as *Strongyloides papillosus* and coccidia. Insanitary conditions, lack of dry, warm sleeping accommodation and an unfavourable climate, debilitated the animals and lowered their resistance to the parasites with disastrous results.—G. WILLIAMSON.

POPOV, P. A. (1936). K'm' v'prosa za pričinitě na planinskata hematurija. [**Plants Conducing to Chronic Haematuria " Mountain Haematuria " in Cattle**].—*Annu. Univ. Sofia.* **9.** 77-118. [Numerous refs.] [German summary].

P. attributes the incidence of haematuria in mountain districts of Bulgaria to the wet summers and lack of calcium and phosphorus in the soil. Vegetation in these regions owing to the nature of the soil, produces glucosides and ethereal oils, and has very little volatility and some toxicity. Forage plants found in these regions include species of *Cynoglossum*, *Veratrum*, *Achillia*, *Allium*, *Colchicum*, *Thymus*, *Stachys*, *Chaerophyllum*, *Plantago*, etc. Water in the neighbourhood of Smoljan (a typical affected area) contains much carbonic acid. He suggests that a toxic action of certain plants is accentuated by their poor nutritive value.

BYRNE, K. V. (1937). **Dermatitis in White Pigs due to Photosensitisation.**—*Aust. vet. J.* **13.** 74-75. [2 refs.]

White pigs grazing on pastures consisting largely of trefoil (*Medicago denticulata*) or lucerne (*Medicago sativa*) became affected with a dermatitis especially behind the ears and down the back. The condition cleared up when the pigs were removed to other pastures in which there were no legumes. Pigs bred by crossing a Tamworth boar with large white sows, although white in colour, showed some pigmentation of the skin and were apparently not susceptible to the dermatitis.
—W. I. B. BEVERIDGE.

ANON. (1936). **Research on Grass Disease in Horses.**—*Vet. Rec.* **48.** 1438.

A note on the programme of work to be undertaken.—D. R. WILSON.

MATTHIAS, D. (1937). Untersuchungen über das Wesen des Hydrocephalus internus acquisitus des Pferdes. [**Acquired** *Hydrocephalus internus* **in the Horse**].—*Arch. wiss. prakt. Tierheilk.* **72.** 48-78. 6 figs., 2 tables. [Numerous refs.]

According to DEXLER, the mechanism of the production of hydrocephalus in the horse consists in an obstruction to the outflow of fluid from the cerebral ventricles by compression of the aqueduct of Sylvius resulting in their distension and a secondary pressure atrophy of the cerebral convolutions. In 1933, however, FRAUCHIGER recorded nine cases of " Dummkoller " in only one of which was there an increase in the size of the ventricles. He suggested that the symptoms were produced by swelling of the brain substance.

M. has carried out measurements on the cranial cavity and brain of 40 horses, 13 being cases of hydrocephalus, and on a few other domestic animals. In the normal horse, the subarachnoid space has an average capacity of 50 c.c. " Kaltblut " horses are more commonly affected with " Dummkoller " than are " Warmblut " horses and this is considered to be associated with the smaller volume of the subarachnoid space in proportion to the brain volume in the former breeds. The total capacity of both lateral ventricles in the normal horse was found to be 8-10 c.c.

In acquired internal hydrocephalus a decrease was found in the size of the subarachnoid space amounting on an average to 40% of its capacity: this was associated with an increase in brain volume which was not uniformly distributed. The essential factor in the production of primary idiopathic hydrocephalus is suggested to be a chronic cerebral oedema.—E. G. WHITE.

GEBAUER, Brigitta. (1936). Der Bilirubinspiegel im Blutserum bei fieberhaften Erkrankungen der Pferde. [**Bilirubin Blood Content in Pyrexial Diseases of Horses**].—*Inaug. Diss., Berlin.* pp. 43. [Numerous refs.]

Most of the bilirubin is produced in the liver. The yellowish colour of the conjunctival mucosa, which occurs in certain disease conditions indicates an increased bilirubin content in the blood. The author made estimations of the bilirubin content of the blood, and found that in horses affected with such febrile diseases as strangles, purpura, pneumonia and equine influenza, there was an increase in half the cases seen. G. gives 0·0082-0·0197 mg. per c.c. as the normal bilirubin content of horse blood. The highest finding was 0·0418 mg. in a case of strangles.—F. FREUDENBERG (BERLIN).

I. FURTH, J., FERRIS, H. W., & REZNIKOFF, P. (1935). **Relation of Leukemia of Animals to Leukemia of Man.**—*J. Amer. med. Ass.* **105.** 1824-1830. 8 figs., 3 tables. [Numerous refs.]

II. Apitz, K. (1937). Die Leukämien als Neubildungen. [**Leucaemias as Neoplasia**].—*Virchows Arch.* **299.** 1-69. 26 figs. [Numerous refs.]

I. Leucaemia occurs spontaneously in mice and the disease shows striking similarities to human leucaemia. The disease in mice can be transmitted to healthy animals of this species by the inoculation of leucaemic blood; cell free extracts are of no use. In neither human beings nor in mice does there occur spread from affected to healthy animals. In the mouse, as in man, leucaemia may be acute or chronic, lymphoid or myeloid, and it may occur as a diffuse infiltration of the tissues or as " tumours ". Histologically, the resemblance is very strikingly shown by a series of photomicrographs illustrating leucaemic infiltrations of a number of organs in man and the mouse.

Various agents may produce leucaemia in mice experimentally, *e.g.* indole, benzene, and X-rays. The last may cause either mediastinal lymphosarcoma with or without generalized lymphomatosis, myeloid leucaemia, or ovarian tumours. The experimentally induced disease has been transmitted to healthy mice and the resulting disease was indistinguishable from the spontaneous form.

It is concluded that there is no essential difference between leucaemia as it occurs in mice and in man, and the authors state that workers who have dealt with both species are in agreement with this view.

II. This is an exhaustive thesis bringing forward evidence both from the literature and from the author's own observations that leucaemia is a neoplastic process. The only animal species which is considered in detail is the mouse; spontaneous leucaemia is mentioned as occurring in almost all species of domestic animals and in the g. pig and South American squirrel.

In both man and animals there occurs an aleucaemic form of the disease in which there is no invasion of the blood by the abnormal cells. It is suggested that the differences found between leucaemia and neoplasia as usually considered are due to the fact that in the former the malignant cells are primitive blood cells. Thus, whilst leucaemic cells possess such characters of neoplastic cells as autonomous growth and irreversible proliferation, they also show certain special features resulting from their origin, namely, the ability to exist in the blood and to infiltrate in a striking way particular groups of organs (Systemerkrankung).

In man, leucaemia can result in a sarcoma, and a lymphosarcoma may give rise to secondary lymphadenotic tumours—further evidence of the similarity of the two diseases.

On the assumption that leucaemia is in fact a neoplastic process, a descriptive classification is suggested on a basis of primary and metastatic characters.

—E. G. White.

Hirt, G. (1936). Lymphás leukaemia sertésben. [**Lymphatic Leucaemia in the Pig**].—*Állatorv. Lapok.* **59.** 187-190. 1 fig., 2 tables. [3 refs.]

Histological examination of the liver, spleen and lymph nodes revealed lymphatic leucaemia in a stunted pig. Liver and lymph node tissue were injected into three healthy pigs and set up in them a transient anaemia and lymphomatosis.

—Z. de Csukás (Magyaróvár).

I. Rohde, G. (1936). Ein Beitrag zur leukämischen Lymphadenose des Schweines. [**Lymphadenosis in Swine**].—*Inaug. Diss., Hanover.* pp. 31. [Numerous refs.]

II. Schröder, O. (1936). Ein Beitrag zur Leukose des Hundes. [**Leucosis in Dogs**].—*Inaug. Diss., Hanover.* pp. 36. [Numerous refs.]

I. Leucosis is uncommon in domestic mammals; cattle are most commonly

affected, horses, dogs, sheep and goats to a lesser extent. A rare case of lymphadenosis in a 14 months old pig is reported. Nearly all the skeletal and organic lymph nodes were affected and the spleen was swollen. Microscopically the changes consisted of proliferation of the lymphatic cells, particularly the lymphoblasts. The Malphigian corpuscles were enlarged and increased in size and number.

II. Three case records of leucosis in dogs aged six, eight and ten years. The blood picture of one of the dogs appeared normal, but that of the other two showed occasional myelocytes and myeloblasts and lymphocytes and lymphoblasts. P.M. a great swelling of the spleen was observed, this, in one case, being so great that the capsule had burst. Hyperplasia of the lymph nodes was also present. On section they were very soft and showed punctiform and linear haemorrhages.

—F. Freudenberg (Berlin).

Bulich, C. (1936). Untersuchungen über die Ursache der lymphoiden Knötchen, der perivaskulären und parabronchialen Zellinfiltrate in der Meerschweinenlunge. [**Causes of Lymphoid Nodules and Cell Infiltrations in Guinea Pigs' Lungs**].—*Inaug. Diss., Hanover.* pp. 27. 3 figs., 1 table. [Numerous refs.]

In a stock of over 3,000 guinea pigs on the island of Riems, B. has studied the clinical characters and histopathology of an infectious broncho-pneumonia resembling influenza in man and animals. The lungs of 150 healthy and affected animals over three weeks old were examined histologically. In every animal, B. found either peribronchial or perivascular cellular infiltration, collections of lymphoid or pseudo-eosinophile cells or areas of thickening resembling atelectasis. More than one of these changes might be present in any one animal. A number of g. pigs obtained from various parts of Germany showed similar lung changes.

These lesions were absent in animals under three weeks old and their aetiology could not be determined.—E. G. White.

Thiers, H., & Boisson, L. de C. (1937). Les causes d'erreur dans l'étude des purpuras expérimentaux avec le lapin comme animal réactif. Les lésions de la mise à mort par saignée carotidienne. [**Causes of Error in the Study of Experimental Purpura in Rabbits**].—*C. R. Soc. Biol. Paris.* **125.** 679-681.

Bleeding rabbits to death from the carotid artery by the technique described causes experimental purpura with lesions in the ears, skin, muscles and viscera. The brain and eyes were not examined.—P. S. Watts.

Craig, J. F. (1936). **Bovine Sterility.**—*Vet. Rec.* **48.** 1503-1514.

C. states that sterility is one of the most common and serious causes of loss in dairy herds. Percentages are quoted taken from four surveys of disposals due to sterility and other causes; the causes, clinical examination, prognosis and treatment are dealt with fully.

He states that sterility is often subsequent to *Br. abortus* infection, but that, on the other hand it is often unrelated to it.—E. E. Jelbart.

McLinden, J. M. (1937). **Sleepy Sickness in Sheep in New Zealand.**—*Vet. J.* **93.** 212-215.

L. first mentions the suitability of the country for sheep grazing and the methods of husbandry and then observes that the sheep are in very good condition in the autumn but lose flesh in winter until lambing occurs. In affected animals

symptoms of the disease appear just before lambing – deep breathing, incoordination of movement, high carriage of head and dilated pupils, often recumbency with inability to rise and rancid breath. The ewes affected are mostly those heavy in lamb though there is no correlation between twins and the incidence of the disease. It is suggested that a more level plane of nutrition would avert the disease. [The disease appears to be pregnancy toxaemia (*V. B.* **5.** 583)].—P. S. Watts.

Filmer, J. F., & Underwood, E. J. (1937). **Enzootic Marasmus. Further Data concerning the Potency of Cobalt as a Curative and Prophylactic Agent.** —*Aust. vet. J.* **13.** 57-64. 4 tables, 1 chart. [9 refs.]

In a previous paper [*V. B.* **6.** 268.] it was reported that enzootic marasmus in sheep could be cured by the administration of cobalt chloride in doses supplying from 0·1 to 2·0 mg. Co daily.

Affected sheep, when recovering either under cobalt administration or after removal to " sound " country, showed a rise in both haemoglobin value and red cell count but this has been found to be followed by a distinct fall and then a second rise. This phenomenon may be due to a temporary iron shortage occurring after utilization of the iron stored as haemosiderin in the liver, kidneys and spleen, iron being required not only for the formation of blood cells, but also for the production of other tissues which increase as the animal rapidly gains weight. A daily dose of 0·1 mg. of Co as cobalt chloride proved to be approximately the lowest dose capable of curing enzootic marasmus in sheep in the Denmark district. To prevent the disease completely in lambs, a daily dose of 0·1 mg. Co was required, doses of 0·05 and 0·03 mg. having a definitely beneficial but sub-optimal effect and doses of 0·01 mg. having a negligible effect. Cattle were cured and maintained in good health for 12 months by administration of 0·3 to 1·0 mg. Co daily. Cobalt chloride proved equal to limonite (the crude iron ore previously found effective and now widely used by farmers) in promoting growth of calves and maintaining condition in older cattle.

Traces of nickel (0·02 mg.) administered together with sub-optimal doses of cobalt (0·05 mg.) proved beneficial in sheep. Cobalt was demonstrated in significant amounts in all supplements which had been proved beneficial in curing and preventing the disease with the exception of dried liver. The efficacy of liver may be due to the presence of a stored factor with properties similar to physin, and cobalt may function through the production of this factor in the body.

—W. I. B. Beveridge.

I. Askew, H. O., & Josland, S. W. (1937). **The Rate of Excretion of Cobalt by Sheep after Drenching with Cobalt Chloride.**—*N. Z. J. Sci. Tech.* **18.** 888-892. 3 tables. [3 refs.]

II. Dixon, J. K. (1937). **The Use of a Cobaltized Salt Lick in the Control of a Lamb Ailment at Morton Mains, Southland.**—*Ibid.* 892-897. 1 fig., 3 tables.

III. Josland, S. W. (1937). **The Effect of Feeding Excess of Cobalt to Healthy Sheep.**—*Ibid.* **19.** 31-37. 3 tables, 1 appendix. [9 refs.]

I. In order to find whether there might be a cumulative toxic action of Co if given regularly to stock in control of bush sickness, a metabolism cage trial was made. Sheep were drenched with 4 mg. of Co as Co chloride.

The greater part of the Co excreted by the kidneys had appeared in the urine after 24 hours while after 72 hours only small amounts appeared. 2% of the total was excreted by the kidneys. The great bulk of Co fed appeared in the faeces within 48 hours of drenching. After 120 hours no Co was excreted in the urine or faeces.

II. Cobaltized salt lick was found to be successful in keeping ewes and lambs in good health in the Morton Mains district where lambs die rapidly in the summer. 4 oz. of Co chloride was used in a ton of agricultural salt.

III. After feeding four sheep daily over a period of 7 months with 1 mg. Co per 200 lb body weight only one developed polycythaemia while two became mildly anaemic. The fourth remained normal. Two hoggets on 5 mg. Co as sulphate became anaemic after five months. No toxic changes were observed microscopically in the organs of the sheep. Storage of Co in organs was definite but small.—C. S. M. HOPKIRK.

HUNTER, D. (1937). **The Parathyroid Glands.**—*Brit. med. J.* May 1st. 929-932. [5 refs.]

A description is given of the active principle and the effect of injected parathyroid extract. The occurrence and diagnosis of hypoparathyroidism, and the treatment of parathyroid tetany is discussed.—R. ALLCROFT.

KENDALL, E. C., & INGLE, D. J. (1937). **The Significance of the Adrenals for Adaptation to Mineral Metabolism.**—*Science.* **86.** 18-19. [2 refs.]

The authors have studied the changes which occur after adrenalectomy. They are of opinion that the symptoms of alarm reaction occurring after the removal of the glands and the circulatory disturbances, hypoglycaemia, changes in the concentration of sodium and potassium in the blood stream, deficiency in phosphorylation or increase in non-protein nitrogen, are the symptoms of adrenal insufficiency, and that the primary change is an inability to resist sudden alterations in the concentration or distribution of electrolytes, rather than, as is suggested by SELYE [*Science.* (1937). **85.** 247.], the liberation from the tissue of some " toxic metabolite ", possibly histamine or some compound physiologically similar. The authors, as a result of their experiments on the administration of potassium to adrenalectomized dogs and rats, consider that potassium should be regarded as one of the " toxic metabolites ".—H. V. HUGHES.

MAREK, J., WELLMANN, O., & URBÁNYI, L. (1937). Die Bedeutung der Knochenanalysen bei der Diagnose von Knochenerkrankungen der Tiere. [**Bone Analysis in the Diagnosis of Bone Diseases in Animals**].—*Arch. wiss. prakt. Tierheilk.* **72.** 1-9. 3 tables. [10 refs.]

Analysis of the mineral ash of bones may afford a valuable indication of the mineral content of the diet. Excess of calcium or phosphorus in the diet gives rise to an increase in the amount of either element deposited in the skeleton, *e.g.* rickets and osteomalacia in piglets were shown to be associated either with excess of calcium or with deficiency of calcium and excess of phosphorus in the diet. The Ca : P and CaO : MgO ratios may provide a clue to the rachitogenic factor in the diet, whereas simple determination of the ash content of the bones would be of little use.

The authors hope to construct tables of standard values for different species of domestic animals, including variations of mineral composition with age. —E. G. WHITE.

SÁLYI, G. (1936). Adatok a malacok májdystrophiájának kórtanához, különös tekintettel a kórszövettani elváltozásokra. [**Dystrophia of the Liver in Sucking Pigs**].—*Állatorv. Lapok.* **59.** 57-61. 2 figs. [19 refs.]

S. examined histologically the livers of 11 pigs which had died from a disease of unknown causation in which the main feature was a toxic necrosis of liver cells.

The irritant had reached the liver by the portal vein. The differentiation from phosphorus poisoning is referred to.—Z. DE CSUKÁS (MAGYARÓVÁR).

HJÄRRE, A., & LILLEENGEN, K. (1936). Wachsartige Muskeldegeneration im Anschluss an C- Avitaminose bei Kälbern. Ein Beitrag zur Aetologie und Pathogenese des sog. " weissen Fleisches " beim Kalbe. [**Waxy Degeneration in Avitaminosis C in Calves, as Bearing on " White Flesh " of Calves**]. —*Virchows Arch.* **297.** 565-593. 7 figs. [Numerous refs.] [Also appeared under amended title (see *Index Veterinarius*) in *Nord. Med. Tidskr.* p. 472. (1936)].

A condition occurring in calves and young cattle characterized by a peculiar waxy degeneration of portions of the skeletal musculature has been recorded, mainly in France, Germany, Switzerland and Norway, since the latter part of the 19th century. Calves are usually affected at 6-10 weeks of age and the symptoms include muscular pain, a stiff gait and, in severe cases, a condition simulating paralysis. The urine contains a considerable quantity of potassium salts, and in older animals there is myoglobinuria.

At autopsy, the lesions are usually symmetrical and the muscles most commonly involved are the supraspinatus, infraspinatus and biceps femoris. Histologically, there is waxy degeneration of the muscle fibres, often with dystrophic calcification. The authors have found similar changes in the myocardium and, in the teeth and bones, lesions identical with those found in scurvy.

The following experiments were carried out on new-born calves :–

1. Three calves were fed on milk heated to destroy completely the vitamin C. One animal died after 92 days and the remaining 2 were killed after 90 and 131 days respectively. The first animal showed symptoms resembling those of the naturally occurring disease and typical lesions in the musculature at autopsy. The other animals remained healthy, but histological changes were found in the muscles.

2. Three calves were reared on a diet completely deficient in vitamins B and C. The results were similar to those obtained in the first group.

3. Three calves were intended to serve as controls ; two, however, died of acute enteritis and the third was supplemented by the addition to the group of 4 normal calves from an abattoir. No lesions were found in the muscles, bones or teeth.

In all 3 groups supplements of vitamins A and D were provided.

The changes in the teeth and bones in natural and experimental cases are described and illustrated in detail.

A review of the literature supports the authors' view that vitamin C deficiency is commonly followed by degeneration of skeletal muscles and it is suggested that this is at least one important factor in the production of " white flesh " in calves. Cattle appear to be most susceptible to deficiency of vitamin C in the diet at two to three months and then become less susceptible with increasing ability to synthesize the vitamin. Most naturally occurring cases of " white flesh " occur towards the end of the winter feeding period at a time when the cow's milk contains least vitamin C.—E. G. WHITE.

BIRD, H. R., KLINE, O. L., ELVEHJEM, C. A., HART, E. B., & HALPIN, J. G. (1936). **The Distribution and Properties of the Anti-Gizzard-Erosion Factor Required by Chicks.**—*J. Nutrit.* **12.** 571-582. 4 tables. [14 refs.] [Copied *verbatim* from *Physiol. Abstr.* **22.** 277. Signed S. J. COWELL].

This dietary factor is not identical with the antihaemorrhagic factor. It was found to be abundant in pig's lung, liver and kidney. Oats contained more of it

than wheat or maize. It was insoluble in ether or alcohol, but was precipitated with the protein when an alkaline extract of lung was acidified.

ALMQUIST, H. J., & STOKSTAD, E. L. R. (1936). **Factors Influencing the Incidence of Dietary Haemorrhagic Diseases in Chicks.**—*J. Nutrit.* **12.** 329-335. 2 figs., 1 table. [3 refs.] [Copied *verbatim* from *Physiol. Abstr.* **22.** 278. Signed S. J. COWELL].

The antihaemorrhagic factor was found to be present in the droppings of chicks fed on a diet devoid of the factor. Less could be extracted from fresh droppings than from those which had stood for 24 hr. The factor was transferred from the hen's diet to the yolk, but not to the white of her eggs.

HEGER, A. (1937). Kollaps durch Verminderung der Stromeschwindigkeit des Blutes und durch Schädigung der Wände der grossen Venen durch aus der Pfortader übergetretene Giftstoffe. [**Collapse Caused by Toxins Coming from the Portal Vein**].—*Tierärztl. Rdsch.* **43.** 270-271.

The elementary physiology of anastomosis and thrombosis is described and the part played by the various chemical products in the blood of the portal vein in the onset of thrombosis followed by collapse is discussed. The hypothetical conclusions are not substantiated by any experimental data.—JAMES STEWART.

PUBLIC HEALTH.

HUCKER, G. J. (1937). **Control of Septic Sore Throat.**—*Amer. J. publ. Hlth.* **27.** 313-320. 7 tables, 1 graph. [2 refs.]

Outbreaks of septic sore throat are associated with the consumption of raw milk infected with the human type of pyogenic streptococcus. The organism is found in the throat of the milker and udder of the infected cow. It is not passed from cow to cow and does not remain in the udder for any great length of time. The streptococcus of ordinary bovine mastitis possesses no public health significance as a cause of septic sore throat in man. Pasteurization will remove infection from the main supply; where this is not possible, the identification and elimination of the infected cow and human carrier are undertaken.—A. L. MULLEN.

ARRAS, A. (1936). Linnade piimaga varustamise küsimusi. [**The Problem of Milk Control in the Towns**].—*Eesti loomaarstl. Ring.* **12.** 142-154. 1 fig., 1 table. [5 refs.]

A. suggests that the control of milk sold in towns should be directed by an official of the health department and that towns should be provided with an office and laboratory in charge of a veterinary bacteriologist, who should be responsible for the quality of milk sold and also for the health of the dairy cows. The latter might be attended to by the local veterinary practitioners or by whole time officials. The cost of this should be raised by a milk levy.—E. RIDALA (TARTU).

BROCKINGTON, C. F. (1937). **The Evidence for Compulsory Pasteurization of Milk.**—*Brit. med. J.* March 27th. 667-668. [13 refs.]

A review of the extent of the danger arising from the consumption of raw milk infected with pathogenic organisms of bovine and human origin. B. concludes that the only reliable method of prevention at the moment lies in compulsory and universal pasteurization.—A. L. MULLEN.

ERIKSSON, K. (1937). Om fukt i ladugårdar. [**Dampness in Byres**].—*Svensk VetTidskr.* **42.** 6-16. 2 figs., 1 table.

In modern byres, now commonly built of concrete, air humidity has become a serious hygienic problem, especially during the winter seasons in cold climates.

The article is a review of the ill-effect of dampness in byres, its origin (*e.g.* 7–8 kg. of water in the form of vapour is discharged by an average-sized cow in 24 hours), and the physical laws governing vapour condensation on the insides of walls and roofs, together with a summary of building principles followed for its prevention.—GUSTAV NAERLAND (OSLO).

THERAPEUTICS.

LEIPER, J. W. G. (1937). **On the Value of Various Chemical Substances as a Means of Destroying Infective Larvae of Horse Sclerostomes in the Field.** —*J. Helminth.* **15.** 153-166. 4 tables. [8 refs.]

Hypochlorite was found to be of no practical value for field and stable use against infective larvae. An application of unoiled calcium cyanide to heavily infected grass plots, applied at the rate of 7 cwts. per acre, killed 70% of sclerostome larvae in the grass and 47% in the undergrowth, without permanently damaging the grass. Financially, the cost was not excessive. Heavy dressings of this artificial manure are very dangerous to pasture, and its successful use would depend upon its even application to as large an area of leaf as possible when a high percentage of larvae has ascended the blades of grass and at a period when the grass is least susceptible to its toxic action. A considerable amount of work, therefore, would have to be done before it could be brought into general use to control the spread of horse sclerostomes.—G. WILLIAMSON.

WRIGHT, W. H. (1936). **Experiments in the Treatment of Poultry Parasites in Puerto Rico.**—*Agric. Notes P.R. fed. agric. Exp. Sta.* No. 73. pp. 7. 1 table.

W. gives the curative value of various dye preparations in the treatment of parasitic infestation in a flock. No definite conclusions can be drawn from the experiments. Gentian violet, azamine and brilliant green were used and appear to possess only limited value.—A. L. MULLEN.

HILLERBRAND, N. (1937). Zur Therapie der Pyo-Septikämie der Fohlen. [**Treatment of Joint-Ill with Prontosil**].—*Münch. tierärztl. Wschr.* **88.** 151-152.

In human medicine the efficacy of p-aminobenzene sulphonamide and other closely related substances, such as prontosil, in streptococcal infections has been conclusively proved and has led to a wide use of these substances, not only in coccal infections, but in many unrelated conditions. In a number of clinical trials in which there were no control observations different people have found that prontosil is not a good general antiseptic for infected tissues. It has, however, been found useful in veterinary practice in the appropriate infections. In this paper several cases of septicaemia in foals were treated with prontosil but not with 100% success. The results, however, justify the conclusion that further trials along similar lines might prove of value.—JAMES STEWART.

SCHOOP, G. (1937). Desinfektionskraft von Alkohol. [**Disinfectant Power of Alcohol**].—*Dtsch. tierärztl. Wschr.* **45.** 193-196. Numerous tables.

Alcohol is widely used as a disinfecting agent but its usefulness as such is

confined to certain types of bacteria. Experiments were carried out with pus-producing bacteria such as *Str. pyogenes*, *Bact. vulgare*, *Micrococcus aureus*, *Bact. aerogenes* and anaerobes such as the bacilli of tetanus, botulism and others. It was found that a 5% solution of alcohol in the ordinary nutrient media did not inhibit growth of any bacteria. A 70% or 96% solution killed non-sporing bacteria in a few minutes while the growth of spore-forming bacteria was not interfered with. S. concludes that the action of alcohol is elective and that alcohol is not suitable for the disinfection of surgical instruments. He also suggests that a preliminary separation of bacteria into classes could be carried out by use of alcohol.—James Stewart.

Forbes, J. C., & McConnell, J. S. (1937). **Crystallisation of Liver Fraction Protecting Against Necrosis from Carbon Tetrachloride or Chloroform Administration.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 359-360. [2 refs.]

A description of the technique employed to obtain a crystalline purine derivative from frozen pig liver which is able to protect rats from carbon tetrachloride and chloroform poisoning.—P. S. Watts.

POISONS AND POISONING.

I. Roholm, K. (1937). **The Fog Disaster in the Meuse Valley, 1930: A Fluorine Intoxication.**—*J. industr. Hyg.* **19.** 126-137. 1 fig. [Num. refs.]

II. Anon. (1937). **Fluorine Poisoning.**—*Lancet.* **232.** 937-938. [3 refs.]

I. R. describes the Meuse Valley Catastrophe of 1930 [*V. B.* **1.** 176.] referring to the Belgian Government's Commission of Enquiry which attributed the disaster to SO_2 in factory smoke present in the fog and suggests that fluorine was actually the cause and, in support, quotes freely from literature of the past few years on the chemistry of fluorine compounds formed during industrial processes and on their poisonous properties for man and animals. The symptoms shown by affected persons in the Meuse Valley resembled those of acute fluorine poisoning. [See also *V. B.* **1.** 253. and **4.** 779].

II. An annotation of I.—J. E.

Bowes, Joane H. (1937). **The Use of Waste Curing Salt Containing Fluorides on the Land. The Possible Dangers to Crops, Livestock and Humans.**—*Lab. Rep. Brit. Leath. Mfrs Res. Ass.* **16.** 193-205. 4 figs., 1 table. [Numerous refs.]

The publication provides a valuable summary of available information on the toxic action of various compounds containing fluorine, and on the use of fertilizers containing sodium fluoride in relation to effect on crops, live-stock and human beings.

It is now a common practice to add one per cent. of sodium fluoride to the salt used for preserving skins, and the used "curing salt" is sometimes sold to farmers as a dressing for arable land. This has no harmful effects on the crops and the amount of fluoride in vegetables grown on such land is not a source of danger to consumers, but if live-stock are allowed free access to grass land recently treated in this way direct consumption of the fluorided salt may be harmful. Addition of lime to the salt would reduce toxicity by formation of insoluble calcium fluoride and incidentally be beneficial to the land.—H. H. Green.

LEROY, G., ISNARD, J., & CAZABAN, F. (1936). Contribution à l'étude des tourteaux de lin cyanogénétiques. [**Cyanogenetic Linseed Cakes**].—*Rev. vét., Toulouse.* **88.** 512-515.

Two heifers of a herd of 19 developed typical symptoms of HCN poisoning 3 days after being fed a concentrate mixture containing linseed cake. Although analysis of the cake revealed only 0·01% HCN it is suggested that these heifers ate much more than their share of the mixture and that, since the HCN content of linseed cake diminishes on storage, manufacturers should not retail cakes until an adequate period has elapsed, allowing the HCN content to fall to a safe limit.
—ALFRED EDEN.

I. MÓCSY, J. (1936). Takarmánymérgezés lovakban vermelt cukorrépafej etetése következtében. [**Poisoning of Horses by Old Sugar Beet Tops**].—*Állatorv. Közl.* **33.** 23-25.

II. MÓCSY, J. (1936). A vermelt cukorrépafej etetése után jelentkező betegség okáról. [**Sugar Beet Poisoning in Animals**].—*Ibid.* 75.

I. On different farms hundreds of horses fed on sugar beet top ensilage have died within the last two years with symptoms some of which were reminiscent of botulism; cattle on the same farms and receiving the same food have remained healthy. Two types of nervous disorder were seen, throat paralysis and more frequently spinal paralysis. Strychnine was of some curative value.

II. Mice, g. pigs and rabbits were fed on sugar beet tops which caused the above losses in horses, but negative results were obtained. The same animals quickly succumbed to botulinus toxin when dosed subsequently.
—Z. DE CSUKÁS (MAGYARÓVÁR).

MCISAAC, P., & SHARMA, G. K. (1936). **Jowar** (*Sorghum vulgare*) **Poisoning in Cattle** [**Correspondence**].—*Indian J. vet. Sci.* **6.** 373-379. [19 refs.]

Arising from a previous article [*V. B.* **6.** 618.] on sorghum poisoning, M. questions the possibility of poisoning, asserting that green jowar or jola has been repeatedly fed to cattle without any fatal consequences, and citing the native practice of feeding plants that have become stunted through drought. S. in reply bases risk of toxicity on feeding stunted jola (due to the production of HCN), quoting an extensive list of references to sorghum poisoning in various parts of the world. Drying of stunted jola in the shade before feeding to cattle is recommended for the elimination of HCN, and in suspected cases of poisoning chemical examination of the ingesta should be carried out.—ALFRED EDEN.

CHRISTENSEN, J. J., & KERNKAMP, H. C. H. (1936). **Studies on the Toxicity of Blighted Barley to Swine.**—*Tech. Bull. Minn. agric. Exp. Sta.* No. 113. pp. 28. 3 figs., 8 tables. [Numerous refs.]

The toxicity of " blighted " grain has been known for a long time. Feeding tests carried out with " scabby " barley have proved that, whereas it is toxic to pigs, horses, and dogs, ruminants are not affected and make good weight gains when fed on it. Many different species of fungi and bacteria are associated with " blighted " barley, the principal being *Alternaria*, *Helminthosporium* and *Fusarium*. The relative toxicity of different lots of grain were determined by making a water extract and administering it to pigs orally *via* stomach tube. An extract of 15 g. of " scabby " grains was sufficient to produce vomiting in a pig weighing 100 lbs. The toxic principle isolated from *Fusarium graminearium* was found to be water-soluble and thermostable. Pigs affected with fusarium poisoning lose their appetites, become listless and weak, vomit occasionally and may even die. The toxic principle

extracted from " blighted " barley can in some cases be detoxicated by the addition of milk, starch or other materials or can be removed from the " blighted " grain by soaking and washing [*V. B.* **6.** 859].—JAMES STEWART.

GUENTHER, D. F. (1937). Tierische Gifte, insbesondere Schlangengifte und ihre hauptsächlichsten Wirkungen auf den tierischen Organismus. [**Action of Animal (Chiefly Snake) Poisons on the Body**].—*Tierärztl. Rdsch.* **43.** 405-407. [1 ref.]

This is merely a résumé of current knowledge relating to the chemical nature, physical characteristics, physiological action and pathological effects of snake and other poisons. No original work is recorded.—JAMES STEWART.

PHYSIOLOGY.

TOPP, H. (1937). Beitrag zur Frage der Rosse und Ovulation bei Stuten. [**Oestrus and Ovulation in Mares**].—*Inaug. Diss., Hanover.* pp. 51. 1 fig. [15 refs.]

T. made macroscopic and microscopic examinations of the ovaries, uterus and vagina of 14 mares whose sexual history was known. Five mares were pregnant and 9 were not. The history indicated that the mares came into oestrum every three to four weeks during the whole year and from the appearance of the ovaries T. assumed that oestrum was always accompanied by ovulation.

During pregnancy the corpus luteum, at first large, decreased progressively in size and became more dense.—F. FREUDENBERG (BERLIN).

HAMBURGER, C. (1936). Weitere Untersuchungen über die gonadotropen Hormone bei der trächtigen Stute. [**Gonadotropic Hormones of Pregnant Mares**].—*Endokrinologie.* **17.** 8-21. 3 figs., 3 tables. [Numerous refs.]

H. records the results of some experiments with gonadotropic hormone from two different sources :-(1) a dried purified preparation from the serum of pregnant mares (" antex "), and (2) a chorion hormone isolated from the urine of pregnant women (" physex "). It was found that " antex " produced follicle formation in the ovaries of infantile mice and rats, maturation of follicles and corpus luteum formation in hypophysectomized female rats, marked development of the testicles and comb in cockerels, considerable growth of the ovaries and maturation of follicles in young rhesus monkeys, and stimulation of the germinative and interstitial tissues of the testicle in infantile male rats. Thus " antex " in its biological actions resembles true anterior pituitary hormone very closely. The site of origin of the hormone in the serum of pregnant mares, whether hypophyseal, or placental, or both, is as yet undetermined.—N. J. SCORGIE.

ARNOLD, J. J. (1937). **A Rabbit Ovulation Test for Equine Pregnancy. Report of the Second and Third Years' Work.**—*Vet. Med.* **32.** 324-327. 4 figs. on 1 plate, 1 table. [2 refs.]

The report contains an outline of the technique employed in the test for equine pregnancy which depends upon the fact that the blood serum of pregnant mares contains a gonad-stimulating hormone in sufficient concentration (from the 45th to the 90th day after breeding) to produce ovulation in isolated does when injected intraven. into them. [Sexually mature does normally ovulate only after receiving a stimulus either from actual copulation or from being " hopped " by another female].

A larger dose of serum was used for the injection in the period under review

than formerly and the percentage of accuracy is now claimed to be 100%. A. points out the value of the practical application of the test.—H. V. HUGHES.

LEMKE, H. (1936). Untersuchungen über die Wasserstoffionenkonzentration des Vaginalsekretes beim Rinde in verschiedenem Lebensalter, während der Trächtigkeit und des Geschlechtszyklus. [**pH of Vaginal Secretions of Cattle**].—*Inaug. Diss., Hanover.* pp. 36. 5 figs., 4 tables. [Numerous refs.]

L. examined and tested by the electrometric method the pH of the vaginal secretions of 73 calves, 19 young cattle, 92 non-pregnant cows and 16 pregnant cows. From 24 calves 1 heifer and 2 cows, the vaginal secretions were acid and those of the others alkaline. The pH of non-pregnant cows (average pH 8·2) was much more alkaline than that of pregnant cows (average value pH 7·64) and of calves (average pH 7·3). The pH fluctuated, but was always alkaline, all through the sexual cycle.—G. HARTMANN (VIENNA).

BOYD, E. M., BLENKINSON, G. W., & MYLKS, G., JR. (1937). **Leucocytosis of Parturition.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 300-301. 1 table. [4 refs.]

An examination of the blood of 14 pregnant women during labour showed that there was a statistically significant increase in the number of white blood cells. There was no significant difference in the lipid content of the W.B.C. as between early and late labour. It is concluded that any increased resistance to infection conferred by the leucocytosis of labour is not due to increased physiological activity of the leucocytes.—N. J. SCORGIE.

BENEDICT, F. G. (1936). **Nutrition of the Elephant.**—*Probl. Nutrit., Moscow.* **5.** 7-20. [Copied *verbatim* from *Physiol. Abstr.* **22.** 177].

Study of the eating processes of the elephant, with reference to the movements of the jaws and the degree to which pieces of rubber embedded in bread and eaten by the elephant were damaged or marked by the teeth in the chewing process, indicates that the mastication is apparently poor, in spite of the highly developed tooth structure. Food passes rapidly through the intestinal tract of the elephant. The poor mastication of food and the relatively rapid passage of food through the intestinal tract explain the poor digestibility of hay (40 p.c.) by the elephant.

DUKES, H. H., & SAMPSON, J. (1937). **Gastro-Intestinal Motility in the Ruminant.**—*Cornell Vet.* **27.** 139-149. [7 refs.]

The article is a preliminary report on the study of gastro-intestinal motility in some 16 sheep.

Under an anaesthetic the abdomen was opened and the contents placed in a saline bath for observation. The results as regards the rumen, reticulum and omasum were less satisfactory than in the case of the abomasum. Spontaneous contraction of the omasum was not observed. Better results were obtained from the intestines. Interesting phenomena were noted in connexion with the large intestine such as a relationship between the caecum and the proximal part of the colon as regards the propulsion of ingesta into the spiral, the apparent absence of cellulose digestion in the caecum, and pellet formation and water absorption in the spiral of the colon.—H. V. HUGHES.

DODDS, E. C. (1937). **Observations on the Structure of Substances Natural and Synthetic, and their Reactions on the Body.**—*Lancet.* **233.** 1-5. 10 figs. [Numerous refs.]

D. briefly indicates the growth of the application of organic chemistry to

medicine and therapeutics and emphasizes that it is possible for organic compounds of different constitution to exert the same therapeutic action. The relationship between molecular structure and physiological function is well shown in the case of the sex hormones, but it is difficult to interpret their chemical and functional analyses because it appears that certain male sex hormone substances are capable of inducing oestrus in the female. Since at least five substances, all of which are oestrogenic, appear to be produced in the body, the question of the specificity of the oestrus reaction is at once raised. D. and his colleagues have recently shown that synthetic substances of simple molecular structure can produce all the complex changes of the oestrus cycle.—R. ALLCROFT.

BARRIE, M. M. O. (1937). **The Relation of Vitamin E to the Anterior Lobe of the Pituitary Gland.**—*Lancet.* **233.** 251-254. 7 figs., 2 tables. [Num. refs.]

B. found that partial or complete deprivation of vitamin E produces hypoplasia of the thyroid gland and degeneration of the anterior pituitary in female rats and their young. Evidence is presented which suggests that failures of the normal reproductive process, of lactation, and of the activity of the thyroid gland in E-deficient rats are due to inadequate secretion of gonadotropic, galactotropic, and thyrotropic hormones by the anterior lobe of the pituitary, which histologically shows degenerative changes. It is concluded that vitamin E is necessary for normal function of the anterior pituitary.—N. J. SCORGIE.

SPINOSA, V. (1936). Osservazioni sulla temperatura normale dei caprini. [**The Normal Temperature of Goats**].—*Nuovo Vet.* **14.** 215-221. 3 charts.

S. points out that distinguished authorities differ as to the normal temperature of goats. He made observations on three groups of goats, the first being stalled except when driven three kilometres per day, the second being kept tied under cover, and the third being left at large. In group I temperatures varied from 38·4°C. to 39·3°C., in group II from 38·5°C. to 39·4°C., and in group III from 38·7°C. to 39·9°C. The author describes variations in temperature resulting from natural causes, and concludes that a mean temperature as high as 40°C. to 40·5°C. if unaccompanied by other symptoms, may not necessarily indicate disease.
—S. F. J. HODGMAN.

TECHNIQUE.

HEGEDÜS, A. (1936). Vitale Färbung von auf farbstoffhaltigen Nährböden gewachsenen Bakterien. [**The Vital Staining of Bacilli cultivated on Dye-Containing Media**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 99-104. 3 tables. [6 refs.]

Strains of dysentery bacilli were grown on media containing trypaflavine and the absorption of the dye by the bacilli was studied. The taking up of the dye is in the nature of vital staining and follows the quantitative laws of adsorption. Bacteria which have taken up dye behave normally as regards motility and multiplication until the concentration of dye within them reaches a certain value: after this is reached the bacterial cells become damaged, and such organisms, and, more especially, dead organisms take up more dye than do normal bacteria.
—E. G. WHITE.

EBERSPÄCHER, C. (1936). Ueber neue Entfärbungsmittel für die Tuberkelbazillenfärbung. [**New Decolorizers for Stains of the Tubercle Bacillus**].—*Zlb. Bakt. I.* (*Orig.*) **138.** 92-99. 3 tables. [16 refs.]

E. suggests that the difficulty found in demonstrating the presence of tubercle

bacilli in tissue or exudates is probably explained by the varying degree of " acid-fastness " of the organisms. He has studied a large variety of decolorizing agents and concludes that the method originally recommended by DOLD – decolorization with one part of 40% urea in 9 parts of absolute alcohol – is particularly useful.
—E. G. WHITE.

NEUMANN-KLEINPAUL, K., & WEYERS, H. (1936). Ueber die Erythrocytensenkung als diagnostische und prognostisches Hilfsmittel bei verschiedenen inneren Erkrankungen des Pferdes. [**Red Blood Corpuscle Sedimentation as a Help in Diagnosis and Prognosis in Various Equine Internal Diseases**]. —*Arch. wiss. prakt. Tierheilk.* **71.** 91-96. 1 fig., 2 tables. [6 refs.]

Red blood corpuscle sedimentation tests have been carried out for years at the medical clinic of the Berlin Veterinary College. As an anti-coagulant a 3·8% solution of sodium citrate is used, the blood being drawn into the tube of citrate in the proportion of 4 : 1. The test can be made without delay or after storage. The tubes are examined every five or fifteen minutes and the results noted on a graph which is used in comparison with a curve for normal blood.

The test is a delicate one for assessing the condition of the horse's state of health, and it gives useful information for prognosis. The normal sedimentation rate occurs in the first few days of any acute local disease and during the development of the chief symptoms the rate is increased and returns to normal during recovery. By means of this the success or failure of treatment can be assessed. The height of the W.B.C. above the column of the R.B.C. can give a useful indication of the progress of the case. In general, it was found that there is an accelerated sedimentation in cachexia and anaemia and in nearly all infectious diseases. There is slowing of the sedimentation rate in laminitis, in myoglobinuria and in obstinate intestinal obstructions. In strangles with metastasis the rate is increased and the leucocytes are increased, but in infectious anaemia there is an increase of rate but no increase in leucocytes.—F. FREUDENBERG (BERLIN).

MISCELLANEOUS.

JACKSON, C. [Edited by]. (1936). **Arnold Theiler Memorial Number.**—*J. S. Afr. vet. med. Ass.* **7.** No. 4.

The first half of the number is devoted to biographical articles on the late Sir Arnold THEILER. The first article on Theiler's life and work, with an appendix giving a list of his published works, is written by P. J. DU TOIT, Sir Arnold's successor at Onderstepoort, and C. JACKSON. The second article by H. H. CURSON is on THEILER and the rinderpest epizootic of 1896-1903.

The contributions are of great historical as well as of personal interest.—J. E.

JONES, T. R. (1937). **Observations of a Stock Inspector in the Jerilderie Pastures Protection District, 1933 to 1936.**—*Aust. vet. J.* **13.** 64-72.

The first portion of this note describes the duties of a stock inspector under the Pastures Protection Act of New South Wales. J. then gives brief notes on the more important diseases of domestic animals occurring in the district under his supervision. Blackleg, toxaemic jaundice, metritis in sheep and a form of sterility in cows have been observed usually associated with scanty, dry pasture.
—W. I. B. BEVERIDGE.

ILJIN, N. A. (1936). **Artificial Thallium Moult in Sheep.** *J. Genet.* **33.** 305-313. 13 figs. on 5 plates, 5 tables. [15 refs.]

The object of this study was the possibility of artificially provoking physiological processes in individuals belonging to a race to which these physiological processes are not naturally proper, though characteristic of individuals of other races of different genetical constitution. The animals used were fine-wooled and mixed-wooled races of sheep and their hybrids, since in fine-wooled sheep no moult can be detected during their whole life period, while in mixed-wooled sheep the process of natural moult can be observed annually. The fine-wooled sheep, with the hybrids, were given doses of various thallium salts at the rate of 10-14 mg. per kg. body weight, in order to try and bring about inhibition of the normal keratoplastic function. Over 2,000 sheep were used in the experiment and it was found that artificial moulting could be set up in this way in practically all the animals given the thallium. Thus it was discovered that moulting can be artificially induced in animals genetically devoid of the character.—JAMES STEWART.

OFFICIAL AND OTHER REPORTS.

INDIA. (1936). **Annual Report of the Imperial Council of Agricultural Research for 1935-36.** pp. iv + 110. Delhi: Govt. India Press. [8vo] [As.14]. [1s. 6d.]

The work of the Animal Husbandry Section of the Council was considerably expanded during the year. Grants were sanctioned for the establishment of an enlarged Animal Nutrition Research Institute at Izatnagar to work in collaboration with the Muktesar Institute and with Provincial institutions engaged in a similar work and for systematic research on poultry diseases, and a Poultry Research Institute at the same place. Izatnagar is a Sub-Station of the Imperial Institute of Veterinary Research, Muktesar.

ANIMAL DISEASES.—District investigation officers continued work on the stock diseases in all major provinces and in some Indian States. Reference is made to the successful results of the systematic use of goat virus in the control of RINDERPEST. Under a grant from the Council a JOHNE'S DISEASE investigation including the study of the curative properties of certain derivatives of chaulmoogra oil is to be undertaken. All-India legislation for the control of disease amongst livestock is now under consideration; a draft Act has been circulated to local governments and minor administrations.—J. C. WALLACE.

AFRICA. KENYA COLONY. (1936). **Report of the Division of Animal Industry for 1935.** [BRASSEY-EDWARDS, H. H.]—*Rep. Dep. Agric. Kenya, 1935.* **1.** 89-124. 21 tables.

STAFF.—A senior veterinary officer retired and his post was retrenched. Three stock inspectors were also retrenched. The revenue was £17,649 and the expenditure £125,014.

ANIMAL DISEASES.—The general situation is described as unsatisfactory. Tables show the number of outbreaks of infectious disease in the settled areas and in native reserves for 1932-1935. Compared with 1934 most of the important diseases, such as RINDERPEST, CONTAGIOUS BOVINE PLEURO-PNEUMONIA, BLACKLEG, FOOT AND MOUTH DISEASE and BOVINE BRUCELLOSIS were less prevalent, but EAST COAST FEVER, AFRICAN HORSE-SICKNESS, ANTHRAX and RABIES all increased.

25,600 cattle were immunized against rinderpest in the settled areas and 71,680 in the native reserves, serum plus virus being used on about 50% of the

former and 46% of the latter. 41 cases of rabies were notified in the settled areas and 12 in the Nasin Gishu and Trans Nzoia district, where animals in the infected area were destroyed (776 dogs, 412 jackals, 76 hyaenas and 75 other species), partly by shooting and partly by poison baits. Government dipping station statistics are given for 1932-1935 inclusive. BOVINE TRYPANOSOMIASIS occurs in the native preserve along the shore of Lake Nyanza and two small outbreaks occurred close by in the settled area. A tsetse fly survey was carried out during the year. Tsetse are present in the coastal region but there are areas which are considered to be free from trypanosomiasis. There were 4 outbreaks of C. BOV. PL.-PN. in the settled areas and several in the native reserves, all being dealt with by segregation and vaccination. Cattle in native reserves where EAST COAST FEVER is enzootic cannot be exported unless immune, in which case they bear a T brand mark.—J. E.

AFRICA. KENYA COLONY. (1936). **Report of the Chief Veterinary Research Officer for 1935.** [DAUBNEY, R.]—*Rep. Dep. Agric. Kenya, 1935.* **2.** 130-162. 3 tables.

The usual statistical results of diagnostic and biological product work are given.

RESEARCH.—Investigation was made into the problem whether animals immunized against RINDERPEST by the vaccine plus virus method acquire an increased immunity following the virus injection to which they fail to react. 1,180 cattle were used, being divided into 3 lots.

" Lot I received a dose of vaccine containing 2 grammes of spleen pulp, followed by 5 c.c. of a centrifuged extracted spleen virus equal in virus content to 2½ c.c. of vaccine. Lot II received vaccine equivalent to 3 grammes of spleen pulp, followed by 5 c.c. of the extracted virus. Lot III were treated with 3 grammes of spleen pulp as vaccine followed by 15 c.c. of the extracted spleen virus. The interval between the inoculations was 14 days. Temperature records were kept of 249 animals during a period of 14 days following the inoculation of virus. The temperature-recorded group included 100 animals of Lot I, and of these 33 showed temperature reactions after the inoculation of virus ; of Lot II 99 animals were recorded, of which 22 showed similar reactions ; and of Lot III 50 animals were recorded and 14 showed reactions ".

Random samples of these three lots were tested for immunity 2½ years later. It was found that most of the reactors to this test were animals which had not reacted to the original virus injection, indicating that it is desirable, for the production of a strong immunity, for cattle to react to the virus in the vaccine-virus method ; and that a large dose of vaccine is undesirable as it blocks out reactors to virus.

EAST COAST FEVER has been found to be transmitted naturally by *Rhipicephalus appendiculatus*, *R. sinus* and *R. evertsi*, and experimentally by *Hyalomma aegyptium impressum*. The Onderstepoort attenuated AFRICAN HORSE-SICKNESS virus strain was obtained and used with success in Kenya. A rapid method of diagnosis, by examining liver tissue for hyaline bodies, was investigated [*V. B.* **7.** 330]. A highly contagious disease was diagnosed as SWINE INFLUENZA, both virus and *Haemophilus influenzae* being recovered from natural cases and transmitted intranasally to healthy swine and also to cattle by suspension from affected lungs. In cattle a transient rhinitis was set up. Pigs of all ages were affected in many parts of the colony, but, in one district sucking piglets were characteristically affected, the condition being stated to be identical with " Ferkelgrippe ". An attempt to demonstrate virus in the bodies of wart hogs and bush pigs caught in places near the sites of outbreaks of EAST AFRICAN SWINE FEVER was unsuccessful.

The organism causing STREPTOTHRICOSIS in sheep and cattle was found to resemble that causing lumpy wool in Australia, though the diseases are not similar clinically.

Prevention of the spread of *Glossina pallidipes* from its home in the Lambwe valley, was inaugurated ; this was done by the creation of a bush-free zone. Three types of fly traps were tested but the results are not yet recorded.

Research on respiratory diseases of sheep showed that there exists in Kenya a chronic pneumonia identical to that of " jaagziekte " of South Africa and also a condition due to the presence of *Muellerius capillaris* larvae. These are readily distinguishable and may both occur in the same sheep. LAIKIPIA LUNG DISEASE was observed as in previous years, but the causal organism had apparently altered, which fact is said to be in accordance with the findings in South African natives affected with pneumococcal pneumonia. Lung lesions of CASEOUS LYMPHADENITIS are common in old sheep in the colony. Short notes are also given on NEWCASTLE DISEASE in fowls, CALF PNEUMONIA, MASTITIS, ENTERO-TOXAEMIA and SWEATING SICKNESS in calves. Research was also carried out on CONTAGIOUS BOVINE PLEURO-PNEUMONIA [*V. B.* **5.** 808.], BOVINE MALIGNANT CATARRH [*V. B.* **7.** 21.] and on an unidentified virus disease of cattle.

EXPERIMENTAL STATION, NAIVASHA.—The station was formerly a government farm, but in 1935 it was enlarged and for 5 years is to receive a grant by the Colonial Advisory Council for the purpose of research into problems of animal husbandry. The research scheme given includes items on sexual physiology and breeding as well as general farming methods.—J. E.

FEDERATED MALAY STATES. (1936). **Annual Report of the Veterinary Department for the Year 1935.** [WHITWORTH, S. H.] pp. 63. 31 tables, 3 appendixes. Kuala Lumpur : W. H. Wyatt, Govt. Printer. [8vo].

STRAITS SETTLEMENTS. (1936). **Annual Report of the Veterinary Department for the Year 1935.** [WHITWORTH, S. H.] pp. 58. 31 tables, 1 appendix. Singapore : W. T. Cherry, Govt. Printer. [8vo] [$1]. [2s. 4d.]

These reports are much more detailed than hitherto and contain much information on animal husbandry.

STAFF.—In addition to the Director, there were four govt. veterinary surgeons, one in charge of each of the four federated states. The officer in Negri Sembilan was also in charge of Malacca (S.S.). There were two other government veterinary surgeons in the S.S. service, stationed at Singapore and Penang respectively.

The REVENUE AND EXPENDITURE of the F.M.S. were $18,347 and $123,848 and that of the S.S. $69,280 and $70,742 respectively.

ANIMAL CENSUS OF F.M.S. AND S.S.—301,900 cattle, 197,800 buffaloes, 315,340 sheep and goats and 658,000 pigs. Figures are also given for each state.

ANIMAL DISEASES (F.M.S.).—Two outbreaks of RINDERPEST occurred in working buffaloes in Perak, and were suppressed by segregation, etc. It appeared in two oxen at Kuala Lumpur quarantine station but was quickly stamped out. One outbreak also occurred in Negri Sembilan. HAEMORRHAGIC SEPTICAEMIA occurred in buffaloes and oxen in Perak and in a train-load of buffaloes coming from Siam. It was controlled by segregation. FOOT AND MOUTH DISEASE was only observed once – in Perak. CONTAGIOUS CAPRINE PLEURO-PNEUMONIA broke out in Perak and was complicated by GOAT POX, the total mortality being 1,713. GOAT POX was troublesome and an investigation was made into it [see p. 125]. C.C. PL.-PN. also occurred in Pahang. SURRA was diagnosed in 12 dogs. No cases of RABIES were reported. CONTAGIOUS STOMATITIS (necrobacillosis) broke out in a herd of goats in Pahang and then died out. Thirteen outbreaks of an avian virus disease, named " diphtheric stomato-pharyngitis " and three of a disease suspected to be fowl cholera occurred in Perak. FOWL POX was

diagnosed in one instance. Animal infirmaries have been set up in Selangor, Negri Sembilan and Pahang.

ANIMAL DISEASES (S.S.).—Details are given of outbreaks mostly in imported livestock at quarantine stations :– RINDERPEST at Singapore, F. & M. DISEASE at Singapore and Penang, a disease suspected to be rinderpest in goats from India at Singapore, OVINE COCCIDIOSIS at Singapore, SWINE FEVER at Singapore and Penang, GOAT POX at Penang and C.C. PL.-PN. at Malacca. Outbreaks of poultry diseases are described. Three were provisionally diagnosed as NEWCASTLE DISEASE, ROUP and FOWL POX respectively, while another resembled Newcastle disease, FOWL PLAGUE and a disease observed in 1934 in Perak. Cross-immunity tests could not be carried out.

RESEARCH (F.M.S.).—The outbreak of GOAT POX mentioned above was closely observed and attempts were made to produce a vaccine. GOAT POX was heretofore unknown in Malaya ; it is described as " atypical or stone pox", as follows :–

" Stone pox may be defined as a febrile contagious disease characterised by a papular cutaneous exanthema and by mucopulent discharges from the eyes and nose. The disease affects goats exclusively and contact sheep do not contract infection. After an incubation period of five to nine days the onset of the disease is marked by staring coat, suspended rumination, loss of appetite, and high fever with acceleration of the pulse and respiration. These preliminary symptoms are accompanied or followed by a discharge from the eyes and nose at first mucoid in character but later mucopurulent and occluding the nostrils, thus inducing violent fits of sneezing accompanied by vigorous shaking of the head in attempts to dislodge the semi-congulated nasal secretions. Excoriation of the skin in the neighbourhood of the nostrils is common, and there may also be mild ulceration in the region of the angle of the mouth encroaching on the buccal mucous membrane.

On various parts of the body flat urticaria like eruptions appear. These are of firm consistence varying in size from a small pea when located near the lips to a marble or hazel nut when on the body proper. Firm pressure applied to the swellings may result in the oozing of one or perhaps two drops of a clear or straw coloured serous fluid, but such fluid cannot always be expressed from the lesions which apparently never reach the stage of *typical* vesicle formation. Pain is acute when the swellings are developing and the animal consequently bleats loudly when handled. Gradually, in favourable cases, the oedema in the neighbourhood of the lesions subsides and the nodules separate from the surrounding tissues and fall off leaving a dull red granulating surface which heals and leaves a permanent white patch on the surface of the skin.

In favourable cases the disease usually runs a course of three to four weeks, but in some goats the period of illness may extend to five or even six weeks, during which time the skin nodules are shed and the discharges from the eyes and nose gradually clear up. In unfavourable cases death may occur at any period even before the skin eruptions have become manifest.

Nodules in the neighbourhood of the coronary band, fet-lock joint or interdigital space frequently become septic and break down leaving large ulcerating surfaces. Lameness ensues, often the direct result of septic laminitis or purulent inflammation of the joints involved. The horns may be shed if severe lesions develop at their bases and eye lesions are often followed by a septic panophthalmia usually terminating in death.

The mortality is usually about 50 per cent. of goats affected, and few goats in a herd escape infection. Kids are especially susceptible, and in these young animals the disease usually runs a very rapid course with a fatal termination.

P.M. appearances vary, the character of the skin lesions depending on the stage at which the animal succumbs. In the one animal hard or septic or ulcerating nodules or a combination of all three nodular stages, may be found on any part of the body, being distributed chiefly around the lips, on the face and ears, neck, trunk, limbs, tail, vulva, and udder or scrotum. These may be distributed discretely or may have broken down into large confluent septic masses. The eyelids may be glued together and the nose occluded by semi congulated mucopurulent material.

The lungs show pneumonic areas of irregular distribution and in such areas greyish homogenous translucent nodules may sometimes be found. In a proportion of cases extensive areas of consolidation may be seen and a fibroplastic or septic pleurisy is sometimes encountered ".

The disease was transmitted to the scarified skin of three test goats. Three others were vaccinated in the same way with a glycerin vaccine prepared from the skin lesions, but it was without effect and human smallpox vaccine was found incapable of immunizing goats against the disease.

A formolized liver and spleen vaccine was found to be incapable of immunizing fowls against " diphtheric stomato-pharyngitis ". Some transmission and vaccine experiments on fowl pox are also described.

RESEARCH (S.S.).—Many small research projects were carried out on RINDERPEST, PIROPLASMOSIS, TRYPANOSOMIASIS, a disease of Indian goats imported from India, F. & M. DISEASE and poultry diseases at Singapore, on GOAT POX and FOWL CHOLERA at Penang and C.C. PL.-PN. at Malacca.—J. E.

NYASALAND PROTECTORATE. (1937). **Report of the Veterinary Department for the Year ended 31st December, 1936.** [DE MEZA, J.] pp. 12. 5 appendixes. Zomba : Govt. Printer. [fcp].

The staff consists of 4 veterinary officers and 253 Africans. TRYPANOSOMIASIS and TICK-BORNE diseases have been the most important causes of loss. EAST COAST FEVER has, however, been kept well under control by the systematic dipping of all cattle in the non-enzootic areas. The danger of the disease being introduced from the surrounding territories is emphasized.

A SPECIFIC OPHTHALMIA is reported as being most frequent among calves in herds of cattle cross bred with imported European breeds.

Cases of DEMODECTIC MANGE of cattle are frequent. There were no cases of RINDERPEST, CONTAGIOUS BOVINE PLEURO-PNEUMONIA, ANTHRAX, BLACKQUARTER or SWINE FEVER. CYSTICERCUS infestation in pigs and cattle are said to be frequently found in the abbatoirs. RABIES continues to increase. AFRICAN HORSE-SICKNESS is recorded with two deaths – 38 horses received treatment with serum from Onderstepoort, and of these one died from the disease. No other disease conditions of importance are recorded. The increase in the numbers of native-owned cattle during the past 28 years amounts to over 257 %. Attention is being given to the development of animal industries : ghee production, marketing of meat, milk, preparation and marketing of hides and skins, etc.—J. A. GRIFFITHS.

INDIA. (1936). **Annual Administration Report of the Army Veterinary Service for 1935-36.** [DIBBEN, A. C.] pp. 14. 8 tables. Simla : Govt. India Press. [8vo].

This report is divided into four parts. Part I consists of four tables, – (1) general statement showing average animal strength, sickness and wastage in India and Burma ; (2) particulars of non-specific diseases ; (3) particulars of specific diseases, and (4) number of cattle immunized against RINDERPEST, and the method employed. The animal strength is given as, horses 32,295, mules 27,938, camels 3,837, cattle 10,554 and donkeys 143. Part II gives the establishment of the Army Veterinary Service and number of Military Veterinary Institutions. Part III contains short notes on certain general diseases, *viz*, COLIC, PARAPLEGIA and PARALYSIS, RINGWORM, BURSATTI and CATARRH. Part IV deals with outbreaks of specific diseases and the horse breeding areas in the Punjab. There were 27 cases (24 deaths) of ANTHRAX as against 15 (all fatal) in 1934-35. 49 cases of EQUINE INFLUENZA were reported as against 3,648 in the previous year ; a synopsis of the successful action taken to prevent the spread of influenza is given. Reference is made to experiments on rinderpest immunization.—J. C. WALLACE.

DENMARK. (1936). Aarsberetning fra Veterinaerdirektoratet for aaret 1935. **[Report of the Veterinary Directorate for 1935].** [HANSEN, P.] pp. xx + 204. 35 tables, 1 map. Copenhagen: A. Johansen.

ANIMAL DISEASES.—ANTHRAX was found in 54 herds, (62 cattle, 1 sheep and 2 pigs). From December, 1934, until November, 1935, no cases of FOOT AND MOUTH DISEASE occurred, but in November, 1935 an outbreak appeared on Seeland. It was not possible to demonstrate the source of infection. Eight days later and in the following months, there were 11 outbreaks on the island of Funen and 2 in southern Jutland. All infected herds were slaughtered and from January 25th, 1936 to the end of 1936 no outbreaks occurred. FOOT-ROT in sheep was diagnosed in 75 flocks and 1,993 sheep were slaughtered. For some years an eradication campaign has been carried out and most of the infected flocks have been slaughtered, but in the marsh district of south-western Jutland outbreaks still occur. Among other groups of infectious diseases SARCOPTIC MANGE in horses was found in three places only. Concerning the combating of BOVINE TUBERCULOSIS about three-quarters of a million tuberculin tests were made, the costs being partly covered by the State, and from November, 1935 to November, 1936, 67,103 tuberculin-reactors were slaughtered and about 5·8 million kroner were paid by the State in compensation to their owners for undertaking total eradication of TB. in their herds. Moreover, 1,129 cows affected with uterine or udder TB. were destroyed and State compensation was given.

STATE VETERINARY SERUM LABORATORY.—10,014 placentas were examined for BOVINE BRUCELLOSIS; *Br. abortus* was demonstrated in 2,643 cases, tubercle bacilli in 112 cases, *Vibrio foetus* in 351 cases and pathogenic fungi in 14 cases. In a compulsory examination of cattle for OX WARBLES only 0·08% of herds were found to be affected on the islands, whereas in Jutland the figure was increased.

ANIMAL CENSUS.—539,000 horses, 3,122,200 cattle and 3,105,600 pigs.
—H. C. BENDIXEN (COPENHAGEN).

ESTONIA. (1936). Riikliku Seerumi-instituudi diagnostilise osakonna 1935.a. tegevuse aruanne. **[Report of the Diagnostic Section of the State Serum Institute, Estonia, for 1935].** [LAJA, F.]—*Eesti loomaarstl. Ring.* **12.** 124-126. 1 table.

17,703 specimens were examined. The diagnostic work was mainly concerned with BRUCELLA INFECTION, 15,558 specimens being examined, out of which 8·28% gave positive reactions. The number of reactors among cattle is, in fact, not very large because a great many blood samples from large infected herds were examined repeatedly.

1,085 specimens were examined for TUBERCULOSIS, including 290 milk samples, 791 bronchial mucus samples, and in 4 cases parts of lungs. *Mycobact. tuberculosis* was present in 17·5% including 7 of the milk samples.

Nine cases of RABIES, 219 of SWINE ERYSIPELAS and 11 of ANTHRAX were diagnosed. More detailed data are given in a table.—E. RIDALA (TARTU).

BOOK REVIEWS.

VAN ROOYEN, C. E. [M.D. (Edin.) Halley Stewart Research Fellow and Lecturer in Bacteriology in the University of Edinburgh]. (1937). **Muir's Bacteriological Atlas.** pp. xvi + 90. 83 plates. Edinburgh: E. & S. Livingstone. [2nd Edit.] [8vo] [15s.]

This bacteriological atlas is an enlarged edition of MUIR's original atlas. It

contains many of MUIR's original drawings, and it has been amplified by some of VAN ROOYEN's plates. There are coloured drawings of all the common organisms of medical importance. Many of the plates show the organisms in natural exudates, stained by various methods. Some plates of various virus inclusion bodies have been added. All the drawings have adequate notes attached.—D. L. HUGHES.

STANDFUSS, R. [Dr med. vet. Prof. Director des Instituts für tierärztliche Nahrungsmittelkunde der Universität sowie des Hessischen Veterinär-Untersuchungsamtes in Giessen]. (1936). Bakteriologische Fleischbeschau. [**Bacteriological Meat Inspection**]. pp. 152. 16 text figs., 13 figs. on 4 plates, 16 tables, 2 graphs. [Numerous refs.] Berlin: Richard Schoetz. [3rd Edit.] [8vo] [RM.7.80].

This is the 3rd edition of this useful work which is the standard text-book on the bacteriology of meat inspection in Germany. In the first part of the book S. deals with the causes and aetiology of meat poisoning and its connexion with the so-called animal paratyphoses – white scour in calves, *Salmonella abortus equi* infection in horses, *S. typhi-suis* the cause of infectious ulcerative enteritis in pigs, *S. pullorum* and *S. gallinarum* in fowls, and mouse and rat typhoid. Further chapters deal with the symptomatology of meat poisoning in man and the circumstances in which it is likely to arise. In the second part of the book the author describes the procedure for the routine bacteriological examination of meat and outlines the diagnostic measures for the isolation and identification of the organisms likely to be met with. The relevant government regulations in Germany are set forth, together with criteria for passing a carcass, or otherwise, for human consumption. A very useful section describes the equipment necessary for a laboratory devoted to the bacteriological examination of meat. The plates showing the cultural characteristics of the bacteria of meat poisoning are excellent. The book should prove an excellent reference to work on this subject, especially to those engaged in meat inspection.—N. J. SCORGIE.

BECKER, W. [Dr med. vet. prakt. Tierärzte in Bevensen (Hannover)]. (1937). Taschenbuch der Geburtshilfe für Tierärzte. [**Handbook of Veterinary Obstetrics**]. pp. 86. 57 figs. Berlin: Richard Schoetz. [8vo] [RM.4.60].

B., one of the leading country practitioners in Germany, here gives the sum of his 50 years experience in obstetrics. He first discusses equipment and choice of instruments, then gives his methods of dealing with the malpresentations which occur in farm animals: and with malformed foetuses. Finally there are chapters on general treatment of puerperal animals and the replacement of the prolapsed uterus.

The little book might be included with advantage in the library of every practitioner undertaking cattle practice.—J. E.

BARRIER, M. [Docteur Vétérinaire]. (1938). Revue générale des ferrures contre les glissades. [**Anti-Slip Devices used in Horse-Shoeing**]. pp. 44. 98 figs. [11 refs.] Paris: Vigot Frères. [4to].

A review mainly of French horse shoes adapted for use in wintery conditions. The devices, too numerous to describe, are roughly of the following types: iron shoes with a narrow web; shoes having the ground surface hammered into ridges; shoes provided with sole pads usually made of rubber and canvas; shoes containing non-slip material sunk into holes in the web; shoes with concave ground surface, and shoes constructed to receive detachable crampons or constructed with high toe pieces and calkins.—J. E.